

FOR: Low power (5 watt) heavy water moderated and reflected reactor
(Pawling Research Reactor)

SITE: NDA's Critical Facility Building, located at Pawling, N. Y.

FOR INTERNAL USE ONLY

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

Page 1

APPLICANT: Nuclear Development Corporation of America
5 New Street, White Plains, N.Y.

DOCKET NO. 50-101

DATE DOCKETED	DESCRIPTION OF DOCUMENTS
April 7, 1958	<p>Ltr. 4/2/58 from NDA (Arnold M. Zais) applying for const. permit and license to cover const. & operation of a low power (5 watt) heavy water moderated and reflected reactor to be known as Pawling Research Reactor to be located in NDA's Critical Facility Building located at Pawling, N. Y., for sale to universities, medical centers and other research institutions. Application included:</p> <p>Report NDA 3002-1 - Pawling Research Reactor Hazards Summary Report dtd. 2/28/58.</p> <p>Report NDA 2-74 - Operating Manual for the NDA Pawling Critical Facility, dtd. 2/28/58.</p> <p>(2 cys. ltr. & 5 cys. of each report rec'd--notarized 4/2/58).</p>
April 21, 1958	<p>Ltr. 4/21/58 to Gov. Harriman (New York) informing him of receipt of appl. by NDA, etc.</p>
May 29, 1958	<p>Ltr. 5/29/58 to NDA (Mr. Zais) informing them that appl. of 4/2 has been assigned a new docket no. inasmuch as License UX-8 (Docket 50- was iss. in connec. with the performance of critical experiments and is not deemed proper to amend it to auth. const. & operation of and conduct of research.... . Req. addl. info re. earliest and latest completion dates, period of license, etc.</p>
July 7, 1958	<p>Ltr. 6/30/58 from NDA furnishing addl. hazards, financial, etc. info requested 5/29/58. Included:</p> <p>10th Annual Report, dated March 31, 1958. (1 cy. rec'd 7/1 & 5 cys. rec'd 7/7/58).</p> <p>(2 cys. of ltr. rec'd 7/1/58 & 13 addl. cys. rec'd 7/7/58) (Notarized 6/30/58).</p> <p>(Ltr. dtd. 7/3/58 from NDA furnished addl. cy. requested by phone 7/2/58--13 cys. of 6/30/58 ltr.; 5 cys. Annual Report; 10, cys. of NDA 3002-1 and 10 copies of NDA 2-74).</p>
July 11, 1958	<p>Ltr. 7/11/58 to NDA ack. receipt of 7/3 & 6/30/58 ltrs.</p>

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U. S. ATOMIC ENERGY COMMISSION

APPLICANT	Nuclear Development Corporation of America 5 New Street, White Plains, N. Y.	DOCKET NO.	50-101
TYPE: Low power (5 watt) heavy water moderated and reflected reactor (Pawling Research Reactor)			
SITE: NIA's Critical Facility Building, located at Pawling, N. Y.			
DOCUMENTS			
DATE DOCKETED	DESCRIPTION		
August 7, 1958	Ltr. 8/5/58 from NDA advising us of their understanding of s necessary for issuance of const. permit, etc. (2 cys. rec'd (Suppl. only)		
August 18, 1958	Ltr. 8/12/58 from NDA trans. financial statements requested b telephone: Schedule of Profit and Loss for the Year ended 3/31/57, Statement of Retained Earnings as at March 31, 1957, and Consolidated Balance Sheet as at March 31, 1957. (2 cys. ltr. & 7 cys. of ea. statement rec'd 8/14/58--not not		
August 27, 1958	Ltr. 8/25/58 from NDA (Peter C. Murphy) trans:		
August 27, 1958	"Certificate of Nuclear Energy Liability Insurance", dtd. 4/1/58, Binder No. 5 issued to NDA on behalf of NELIA. (2 cys. ltr. & 5 cys. of Binder rec'd--eff. 1/1/58 to 12/31/58)		
August 29, 1958	Ltr. 8/29/58 to NDA ack. receipt of NELIA binder.		
September 16, 1958	Ltr. 9/16/58 to NDA trans:		
September 16, 1958	"Notice of Proposed Issuance of Construction Permit and Facility License to Nuclear Development Corporation of Amer ca", dtd. 9/16/58, and		
September 16, 1958	Memorandum, dtd. 9/16/58.		
September 16, 1958	Ltr. 9/16/58 to Gov. Harriman (N.J.) trans. copy of notice & memo of 9/16/58 for NDA.		
October 7, 1958	Ltr. 10/7/58 to NDA trans:		
October 7, 1958	Construction Permit No. CFRR-29 issued to NDA 10/7/58 to auth. const. of low power research reactor.		
October 7, 1958	"Notice of Issuance of Construction Permit" to NDA, dtd. 10/7/ filed with FR.		
October 7, 1958	Ltr. 10/7/58 to Gov. Harriman (NY) trans. copy of NDA's const. permit.		

U. S. A. T. O. M. I. C. E. N. E. R. G. Y. C. O. M. M. I. S. S. I. O. N

APPLICANT	Nuclear Development Corporation of America 5 New Street, White Plains, N. Y.	DOCKET NO.	50-101
FOR:	Low power (5 watt) heavy water-moderated and -reflected reactor (Pawling Research Reactor)		
SITE:	NDA's Critical Facility Building, located at Pawling, N. Y.		

DOCUMENTS

DATE DOCKETED	DESCRIPTION
October 22, 1958	Ltr. 10/22/58 to NDA trans:
October 22, 1958	Facility License No. R-49 issued to NDA 10/22/58 for oper of "Pawling Reactor".
October 22, 1958	"Notice of Issuance of Facility License" to NDA, dtd. 10/22/58 to FR.
October 22, 1958	Ltr. 10/22/58 to Gov. Harriman (NY) trans. copy of Lic. R-49
November 26, 1958	Ltr. 11/26/58 to NDA trans. two copies of interim indemnity agreement for sign., date & return of one copy to us--re Lic. R-49.
December 8, 1958	Ltr. 12/8/58 from NDA returning a signed copy of the interim indemnity agreement -- sgd. "Arnold M. Zais, Treasurer" & Accepted "12/5/58".
February 26, 1960	Ltr. 1-29-60 from NDA to LJ re. lattice experiments they prop and their being license exempted, etc.--suppl. only.
February 26, 1960	Telegram 2-18-60 from NDA requesting amendment to License R-49 to auth. performance of experiments described in Hazards Summ Report NIA-2109-3, dtd. 9-30-59, -- "Pawling Lattice Test Rig Advising us that cys. of HSReport sent to NYOO & SROO; (Rec 2 (PLATR)
February 26, 1960	Report NDA-2109-3--"Pawling Lattice Test Rig Hazards Summa Report", dtd. 9-30-59 (6 cys. rec'd in Dec. 59 fr NYOO). <i>44 addl. cys. rec'd 3-16-60.</i>
February 26, 1960	Ltr. 2-19-60 from NDA formally requesting amendment to Lic. R-49 to auth performance of experiments in NIA-2109-3 in the Pawling Research Reactor. (14 cys. rec'd 2-23-60--not. 2-19-60).
February 26, 1960	Ltr. 2-25-60 to NIA trans: Amendment No. 1 to License No. R-49, dtd. 2-25-60, which a install. of a new heavy water moderated, graphite and heavy water moderated reactor, designated as Pawling Lattice Rig, in its Pawling Research Reactor and to conduct expts. at powerlevels up to 50 watts... AND the receipt, possession & use of 3 & 3/4 Mm (continued)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT	Nuclear Development Corporation of America 5 New Street, White Plains, N. Y.	DOCKET NO. 50-101
FOR: Low Power (5 watt) heavy water-moderated and -reflected reactor (Pawling Research Reactor) & Pawling Lattice Test Rig (PLATR). SITE: NDA's Critical Facility Bldg., located at Pawling, N. Y.		
DOCUMENTS		
DATE DOCKETED	DESCRIPTION	
Feb. 26, 1960	Ltr. 2-25 to NDA trans continued: "Notice of Issuance of Facility License Amendment" to NDA, dtd. 2-25-60, and Hazards Analysis, dtd. 2-25-60.	
February 25, 1960	Ltr. 2-25-60 to Gov. Rockefeller (NY) trans. cy. of NDA's notice & of 2-25-60.	
April 15, 1960	Ltr. 4-15-60 to Nuclear Development Corp trans. cys. of amends. to Part 140, etc., and advising them that they will be rec'd to furnish financial protection in amt. of \$1,000,000, prior to 5-7-60.	
May 6, 1960	Tel 5-6-60 to NDA advising them that reply to our 4-15-60 ltr. req'd by close of business 5-9-60.	
May 9, 1960	Ltr. 5-6-60 from NDA furnishing: Declarations Page to Policy NF-3, Endorsement 8 to Policy NF-3--wh'ch is for \$1,000,000, Declarations to Policy NF-5, and Endorsement 9 to Policy NF-5--which is for \$1,000,000. (1cy each of ltr. & encls. rec'd).	
June 3, 1960	Ltr. 6-3-60 to NDA advising them that proof of financial protection under License R-49 is satisfactory.	
Jan. 10, 1961	Telegram 1-10-61 to NDA advising them that we are surveying all lic reactor facilities for info gained from oper exp. which indicates confirm. of or variance from nuclear character. shown in lic. appl. time of lic issuance; accordingly, a report on max excess reactivity total control rod worth, etc., should be filed within 20 days.	
Feb. 1, 1961	Ltr. 1-26-61 from NDA replying to our telegram of 1-10-61. Included Attachment PH -1765A. (15 complete cys. rec'd--all reproduced signs)	
Feb. 3, 1961	Ltr. 2-3-61 to NDA ack. 1-26-61 filing.	

U.S. ATOMIC ENERGY COMMISSION

APPLICANT Nuclear Development Corporation of America DOCKET NO. 50-101
 5 New Street, White Plains, N.Y.

FOR: Low Power (5watt) heavy water-moderated and -reflected reactor (Pawling Research Reactor) & Pawling Lattice Test Rig (PLATR).
 SITE: NIA's Critical Facility Bldg., located at Pawling, N. Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
Apr 5, 1961	Ltr. 4-5-61 to NIA req. info as to current status of and future plans for their operating organizations for each reactor facility by 4-30-61.
May 2, 1961	Ltr. 5-1-61 from NIA replying to our ltr. of 4-5-61 re operating organization. Included: "Job Descriptions". (15 cys. rec'd between this case & 50-23--n/n)
May 9, 1961	Ltr. 5-4-61 from NDA advising that assets and business of NDA will be transferred to United Nuclear Corporation on or about 5-31-61, with all facilities and personnel and practices and procedures in effect as before and requesting that Facility License R-49 be transferred to United Nuclear Corporation. Included: Attachment A -- Nuclear Development Corporation of America Notice of Special Meeting of Stockholders--for. 5-24-61, dtd. 5-2-61. (2 cys. of ltr. & attach. rec'd 5-5-61--not notarized). (25 addl. cys. rec'd between this case & 40, 70 & 30 cases on 5-10-61 & given to LJ).
May 12, 1961	Ltr. 5-9-61 from NDA advising us that they plan to establish UNC's headquarters office in NY City in the near future, but in the meantime the Chairman and Pres. of UNC (Mr. William C. Foster) can be reached in D. C. FE 3-2376 and mail addressed to Foster c/o Olin Mathieson Nuclear Corp at 460 Park Avenue, NYK 22 and confirming divisional designations in transfer of licenses. (1 cy rec'd & 30 cys. verifaxed -- 22 & original to LJ).
May 18, 1961	Ltr. 5-12-61 from NDA requesting that Lic. CX-8 under 50-23 be terminated inasmuch as Lic. R-49 superseded CX-8. -- suppl. only in this case--(See 50-23).
May 22, '61	Ltr. 5-22-61 to NIA ack. 5-4 & 5-9 re. re transfer to United Nuclear Corp.
May 23, '61	Ltr. 5-23-61 to NIA trans. cy of notice of amend. to Part 140 advising that as licensee who has furnished nuclear energy liability ins. as proof of financial protection and has entered into an IIA w/AEC, it will be necessary that the IIA be replaced by a definitive agreement as provided in amend. to Part 140, etc.
May 24, '61	Ltr. 5-23-61 from NDA trans. the following report and requesting that Lic. R-49 be amended to auth performance of PLATR critical expts. under the conditions of HS Report NIA-2109-3 as modified by Amend. No. 1 to NDA 2109-3 (NIA-2131-37): Report NDA-2131-37--"Amendment I to Pawling Lattice Test Rig Hazards Summary Report" (NIA-2109-3), dtd. 5-15-61, which brings info submitted in NIA-2109-3 up to date. (14 cys. rec'd of ltr. & report--not notarized).

U.S. ATOMIC ENERGY COMMISSION

APPLICANT ~~United Nuclear Corporation~~
 5 New Street, White Plains, N.Y. DOCKET NO. 50-101

FOR: Low Power (5 watt) heavy water-moderated and -reflected reactor (Pawling Research Reactor) & Pawling Lattice Test Rig (PLATR).

SITE: NIA's Critical Facility Bldg., located at Pawling, N.Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
May 26, 1961	Ltr. 5-26-61 to ACRS trans 3 cys. of NDA's 5-23-61 filing.
June 7, 1961	Ltr. 6-6-61 to NIA trans: "Questionnaire on Gaseous Effluent Practices" for th reply by 7-31-61.
June 12, '61	Ltr. 6-8-61 from Marsh & McLennan trans: Endorsement 14 to NF-3, eff. 6-1-61, which changes name of insured to United Nuclear Corporation. (1 cy ltr. & 8 cys of end. rec'd).
Jun 27, 61	Ltr. 6-27-61 to UNC requesting reply to our 5-23-61 ltr. on Part 11.0 re propose description of the location for consideration in connection with the preparatio of a definitive agreement.
y 6, 61	Ltr. 7-5-61 from United Nuclear req. cy of indemnity agreement for NDA for Lic. R-49. -- suppl. only.
July 12, 61	Ltr. 7-10-61 from United Nuclear Corp. replying to our 6-6-61 questionnaire to 11 stating that operation of their reactor does not create a gaseous radioactive effluent problem... (1 cy rec'd).
July 13, 61	Ltr. 7-13-61 to United Nuclear Corp. trans: Amendment No. 2 to License No. R-49, dtd. 7-13-61, which changes name from <u>Nuclear Development Corp of America to United Nuclear Corp</u> , adds reporting requirement and procedures re changes in core reactivity when reactor is shut down, "Notice of Issuance of Facility License Amendment" to UNC, dtd. 7-13-61, and Two copies of Interim Indemnity Agreement for R-49 for sign, date and return of one copy.
July 13, 61	Ltr. 7-13-61 to Oliver Townsend of Office of Atomic Development, Albany, trans. of Amend. 2 to R-49 and Notice.
July 13, 61	Ltr. 7-13-61 to Chairman of Cty. Bd. of Supervisors of Poughkeepsie, N.Y. trans cy of Lic. R-49, Amendments 1 & 2 thereto and Notice of 7-13-61.

U.S. ATOMIC ENERGY COMMISSION

APPLICANT United Nuclear Corporation
 5 New Street, White Plains, N.Y. DOCKET NO. 50-101

FOR: Low Power (5 watt) heavy water-moderated and -reflected reactor (Rawling Research Reactor) & Pawling Lattice Test Rig (PLATR).

SITE: NEA's Critical Facility Bldg., located at Pawling, N.Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
July 13, 61	Ltr. 7-13-61 to ACRS trans. 3 cys. each of 7-13 Notice & Amend. 2 to R-49.
July 13, 61	Ltr. 7-13-61 to FR trans. UNC's Notice for publication.
July 13, 61	Ltr. 7-13-61 to JCAE trans. cy of Amend. 2 to R-49 & FR Notice.
July 14, 61	Ltr. 7-14-61 to United Nuclear Corp trans cy of I Agreement of 11-26-58 per 7-5 req.
July 20, 61	UNC's Notice was filed 7-18-61, publ. 7-19-61, 26 FR 6485.
July 24, 61	Interim Indemnity Agreement of 7-13-61 returned by UNC as accepted 7-19-61 by John R. Menke.
July 25, 61	Ltr. 7-24-61 from Marsh & McLennan trans: Endorsement 15 to NF-3, eff. 6-1-61, which amends address of insured to United Nuclear Corporation, P. O. BOX 1883, 365 Winchester Avenue, New Haven 4, Connecticut. (2 cys. ltr. & 8 cys. of end. rec'd).
Oct. 2, 61	<i>→ see page 8 for 9-27-61 ltr</i> Ltr. 9-28-61 from Marsh & McLennan trans: End. 16 to NF-3--"Amendatory Endorsement" issued 8-14-61. (1 cy ltr. & 8 cys. of end. rec'd).
Oct. 2, 61	Ltr. 10-2-61 to M&M ack. End. 16.
Oct. 24, 61	Ltr. 10-23-61 from M&M trans: End. 17 to NF-3--Earned Premium Endorsement CY 1960, issued 9-25-61. (1 cy ltr. & 8 cys. of end. rec'd).
Oct. 24, 61	Ltr. 10-23-61 from M&M trans: End. 18 to NF-3--Increase of Limit of Liability Endorsement, issued 10-17-61, increasing limit to 32,000,000 as of 10-11-61. (1 cy ltr. & 8 cys. of End. rec'd).
Oct. 27, 61	Ltr. 10-27-61 to M&M ack. Ends. 17 and 18 to NF-3.

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U.S. ATOMIC ENERGY COMMISSION

APPLICANT United Nuclear Corp.
5 New Street, White Plains, N. Y. DOCKET NO. 50-101

RNR: Low Power (5 watt) heavy water-moderated and reflected reactor (rawling Research Reactor) & Pawling Lattice Test Rig (PLATR)
SITE: NIA's Critical Facility Bldg., located at Pawling, N. Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
Dec. 13, 61	Ltr. 9-27-61 from UNC requesting to be advised on the status of their May 23, 61 filing. (rec'd in L&R 9-29-61--rec'd in Locketing Sec 12-13-61) (Suppl. Only)
Dec. 13, 61	Ltr. 12-13-61 to UNC req them to submit within 15 days a written explanation as to why deviations from NIA 3002-1 and NIA 2109-3 as listed in NIA 2131-37 found to be in effect during the 8-28-61, inspection were in violation of Lic R-59; and req them to provide a desc'n of vault and shelf arrangement, etc. before complete evaluation of their appl 5-23-61.
Dec. 27, 61	Ltr. 6-26-61 from UNC replying to our ltr of 5-23-61 (to their Predecessor Nucl Development Corp of America) re Part 140. (rec'd in L&R 6-28-61--rec'd for docketing 12-27-61) (sent EB per Huard)
Dec. 28, 61	Ltr. dtd 12/29/61 to United Nuclear Corp. requesting copies of Endorsements 9 thru 13, inclusive, to NEMIA Policy No. NF-13 and copies of endorsements the advance premium endorsements for 2 x calendar Year 1962, also requesting them to sign and return the Indemnity Agreement No. B-16 Enclosure: Indemnity Agreement No. B-16
Dec. 27, 61	ltr. dtd 12/27/61 fm Marsh & McLennan Trans: 1. End. 20 (Advance Premium Endorsement Calendar Year 1962) to NF-3 eff. 1-1-62, issued 12/1/61. 2. End. 19 (Changes in Subscribing Companies and in their proportionate liability endorsement) to NF-3, eff. 1-1-62, issued 12/1/61. 2x cy of ltr and 8 each received (not notarized)
Dec. 29, 61	Ltr. dtd 12/29/61 fm United 2x Nuclear Corp. ack our ltr of 12/13/61 and furnishing additional info as requested by us in above letter including sketch dtd 12/28/61 (Outer Buffer Fuel Element Attachment), <i>sent 13. 7/1/62</i>
Jan. 10, 62	Ltr. J/10/62 to AGRS trans; Three copies of a letter from United Nuclear Corporation to USAEC dtd 12/29/61 regarding Lic. No. R-49
Jan. 18, 62	Ltr. dtd 1/18/62 to B & W requesting them to act on indemnity agreement which indemnified activities under AEC Lic. Nos. CX-1, CE-10, CX-12 and R-47 which we requested in our letter of 12/2/61 (see 50-13)
Jan. 18, 62	Ltr. dtd 1/17/62 fm B & W, ack our ltr of 12/27/61 to Dr. L. F. Currie and advising that copies of their 1962 premium endorsement and all other current endorsements have been forwarded to our office. (see 50-13)

U.S. ATOMIC ENERGY COMMISSION

APPLICANT United Nuclear Corp.
5 New Street, White Plains, N. Y.

DOCKET NO. 50-101

PCR: Low power (5 watt) heavy water-moderated and reflected reactor (Pawling Research Reactor) & Pawling Notice Test Rig (PLATR)
SITE: NDA's Critical Facility Bldg., located at Pawling, N. Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
Jan 24, 62	<p>Ltr. 1-18-62 from Marsh & McLennan trans: (on behalf of United Nuclear Corp.)</p> <p>1--End No. 9 to Policy NF-3, issued 11-2-59, eff 1-1-60, "Changes in subscribing companies....."</p> <p>2--End No. 10 to Policy NF-3, issued 11-2-59, eff 1-1-60, "Advance Premium 1"</p> <p>3--End. No. 11 to Policy NF-3, issued 8-1-60, eff 12-31-59, "Earned Premium Endorsement"</p> <p>4--End. No. 12 to Policy NF-3, issued 11-1-60, eff 1-1-61, "Changes in subscribing companies..."</p> <p>5--End. No. 13 to Policy NF-3, issued 11-28-60, eff 1-1-61, "Advance Premium End"</p> <p>(1 cy. of ltr & 8 of encl rec'd)#1147</p>
Jan. 29,62	<p>Ltr. dtd 1/26/62 to UNC thanking them for their ltr of 12/29/61, informing us they have corrected those deficiencies in their ix lic. program which we brought to their attn. in our ltr of 12/13/61 also advising them that changes to the facility beyond the scope permitted by the current license should be submitted for Commission evaluation and authorization prior to initiation.</p> <p>encl: ltr to Kirk fm Murphy dtd 12/29/61</p>
Jan. 30,62	<p>Ltr. dtd 1/29/62 to UNC trans. Amend. No. 3 to Facility License No. R-49 which authorizes UNC to possess and operate the nuclear reactor, designated as the "Pawling Research Reactor" and located at Pawling, N.Y. also advising that the auth. were among those requested in their appl. for amendment dtd 1/23/61 and the remaining auth. requested by them are now under consideration and we will advise them when action is taken xxxx regarding them.</p> <p>Encls:</p> <ol style="list-style-type: none"> 1. Amendment No. 3 to Lic. No. R-49 2. Notice to Office of FR 3. Hazards Analysis
Jan. 30,62	<p>Ltr. dtd 1/29/62 to Chairman Board of Supervisors, trans. Amend. No. 3 to Fac. Lic. No. R-49 which authorizes UNC to possess and operate the nuclear reactor, designated as the "Pawling Research Reactor" and located at Pawling, N.Y. also advising that these auth. were among those re. in their appl. for amendment dtd 1/23/61 and the remaining auth. req. by them are now under consideration and we will advise them when action is taken regarding them.</p> <p>encls:</p> <ol style="list-style-type: none"> 1. Amendment No. 3 to Lic. No. R-49 2. Notice to Office of FR 3. Hazards Analysis
Jan. 30,62	<p>Ltr. dtd 1/29/62 to Townsend trans. Amend. No. 3 to Fac. Lic. No. R-49 which authorizes UNC to possess and operate the nuclear reactor designated at Pawling Research Reactor" located at Pawling, N.Y. also advising that these auth. were among those re. in their appl. for amendment dtd 1/23/61 and the remaining auth. req. by them are now under consideration and we will advise them when action is taken regarding them.</p>

U. S. ATOMIC ENERGY COMMISSION

Page Ten

APPLICANT	United Nuclear Corp. 5 New Street, White Plains, N.Y.	DOCKET NO.	EC-101
FOR: Low Power (5 watt) heavy water-moderated and reflected reactor (Fawling Research Reactor) & Fawling Lattice Test Rig (Platr) SITE: NRC's critical Facility Bldg. located at Pauline, N.Y.			
DOCUMENTS			
DATE DOCKETED	DESCRIPTION		
Jan. 30, 1962	continued from following page: encls: 1. Amendment No. 3 to Facility License No. R-49 2. Notice to Office of FR 3. Hazards Analysis		
Jan. 30, 1962	Ltr. dtd 1/29/62 to ACRS trans. following documents entitled "Issuance of Amendment No. 3 to Facility Lic. No. R-49 1. Notice to Office of FR 2. Amendment No. 3 to Facility License No. R-49 R-49 3. Hazards Analysis		
Jan 31, 62	Ltr. 1-31-62 to HEW (Terry) trans cy of Amendment No 3 to Lic R-49; Notice, and Hazards Analysis.		
Feb. 5, 62	Notice of of issuance of Amendment No.3, issued 1-29-62 filed in FR 2-2-62; published 2-3-62; Citation 27 FR 1037....no action required (30-day intervention)		
Feb. 12/62	Ltr. dtd 2/12/62 fm UNC re: our ex ltr of 12/28/61 enclosing two xxx signed copies of a formal indemnity agreement which indemnified activities under AEC Lic. No. R-49, also advising them we would appreciate their early action on this matter.		
Feb. 19, 62	Ltr. dtd 2/16/62 fm Marsh & McLennan, regarding their ltr of 1/13, at which time xxxx they transmitted certain material an info to us with regard to endorsements issued under the captioned policy(Nelia Policy No. NF-3) <i>UNC pending; New York</i>		
Mar 22, 62	Ltr. 3-21-62 fm Marsh & McLennan advising that they assume that matl presented in their ltr of 2-16-62 is satisfactory (since they haven't heard from us. (suppl only)#3130		
Mar 27, 62	Ltr. 3-27-62 to Marsh & McLennan advising them that ltrs of 2-16, 3-21 and 1-18 was the proof of financial protection required re UN, but our further comm. w/UN was re. formal indemnity agreement which will we contact them re.		
March 27, 1962	Telegram 3-27-62 to UNC req. them to advise us of what action they are taking on formal indemnity agreement sent w/our ltr of 12-28-61 which has never been returned by them.		
Apr 11, 62	Ltr. 4-9-62 from UNC trans. 1 cy of Indemnity Agreement No. B-16 dtd 12-28-61, for act licensed under Lic R-49, signed and accepted by John R Menke, Vice President.		

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WLR-5 (3-62)

U. S. A T O M I C E N E R G Y C O M M I S S I O N

United Nuclear Corp. & Sabre-Pinon Corp (eff 9-13-62)
 APPLICANT 5 New Street, White Plains, N. Y.

DOCKET NO. 50-101

FOR: Low Power (5 watt) heavy water-moderated and reflected reactor (Pawling Research Reactor) & Pawling Lattice Test Rig (PLATR)
 SITE: NDA's Critical Facility Bldg. located at Pawling, N. Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
Apr 23, 62	<p>Ltr. 4-23-62 to UNC trans:</p> <p>Amendment No 1 to Indemnity Agreement No. B-16 (2 cys), which implements the provisions of Public Law 87-206 and is eff as of 9-6-61, for signature and return of one cy.</p>
May 4, 62	<p>Ltr. 5-1-62 from UNC advising that on 4-2-62 UNC merged into and transfer all of its assets and business to Sabre-Pinon Corporation; therefore, the req that Lic R-49, amendment # 3, be further amended to transfer the lic to the new corporation. Included:</p> <p>"Proxy Statement" dtd 2-27-62. (6 cys of each rec'd--notarized 5-1-62)#4510 (16 addl cys rec'd 5-17)</p>
May 7, 62	<p>Ltr. 5-3-62 from UNC returning Amendment No 1 to IA No B-16, accepted 4-6-62 by John R. Menke. #4534</p>
May 9, 62	<p>Ltr. 5-9-62 to UNC req them to furnish sixteen addtl cys of their appl 5-62 and Proxy Statement dtd 2-27-62.</p>
May 17, 1962	<p>Ltr. 5-14-62 from United Nuclear Corp trans. 16 addl. cys of 5-1-62 filing (1 cy ltr rec'd--#4831)</p>
May 22, 62	<p>Ltr. 5-22-62 to Terry of HEW trans. cy trans. cy of UNC's 5-1-62 filing.</p>
May 22, 62	<p>Ltr. 5-22-62 to Townsend of Off of Atomic Development trans cy of UNC's 5-1-62 filing.</p>
Aug 8, 62	<p>Ltr. 8-6-62 from Marsh & McLennan trans the following which accommodates a reduction in the Limit of Insurance afforded to \$1,00,000 for UNC:</p> <p>End No 21 to NF-3, "Reduction of Limit of Liability End," issued 7-26-62, eff 7-6-62. (1 cy of transl ltr & 8 cys of encl rec'd--#8120)</p>
Aug 16, 62	<p>Ltr. 8-16-62 to UNC advising them of recent amendments to Part 50 and suggesting that they submit proposed tech. specs for our approval if they do not already have such designated in hazards summary report, in order for them to take advantage of the flexibility afforded by the amends. (form ltr)</p>
Sept 13, 62	<p>Ltr. 9-13-62 to UNC trans:</p> <p>Amendment No 4 to Lic R-49, dtd 9-13-62, which authorizes a new corporate entity also to be known as UNC which was formed by the merger of UNC and the Sabre-Pinon Corporation on 4-2-62 and in accordance with their req of 5-1-62.</p> <p>Related Notice, dtd 9-13-62.</p>

WLR-5 (3-62)

U. S. ATOMIC ENERGY COMMISSION

United Nuclear Corp. & Sarre-Pinson (Lic 9-13-62)
 APPLICANT 5 New Street, White Plains, N. Y.

DOCKET NO. 50-101

FOR: Low Power (5 watt) heavy water-moderated and reflected reactor (Pawling Reactor) & Pawling Lattice Test Rig (Pawling Reactor)
 SITE: NDA's Critical Facility Bldg. located at Pawling, N. Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
Sept 13, 62	Ltrs 9-13-62 to the following trans cy of Notice, dtd 9-13-62: County Board of Supervisors SG Terry of HEW Townsend (Office of Atomic Development, NY)
Sept 17, 62	Ltr 9-17-62 to OFR trans Notice of Issuance of Amendment for publication
Sept 19, 62	Ltr 9-19-62 to UNC furnishing guide prepared by DL&R to provide guidance on the organization and contents of HER and to describe the use of these reports by DL&R in evaluating appls for licenses--which is for their comments and suggestions (and is to be rec'd by 1-1-63) for modification to be included in a revised publication. (form ltr)
Sept 26, 62	Notice of Issuance of Amendment No 4 filed 9-20-62; published 9-21-62; Citation 27 FR 9420 (Dec. 62-9404); no action required.
Oct 25, 62	Ltr 10-18-62 from UNC to NYOO entitled, "Monthly Progress Ltr No. 12 for the period August 1, 1962 to Sept 30, 1962" (1 cy rec'd--#9994) (suppl c
Nov. 29, 62	Ltr. 11-28-62 fm Marsh & McLennan trans: End No 24 to NF-3, "Standard Prem and Reserve Prem End (Cal Yr 1961 issued 9-15-62; eff 4-16-57. (1 cy of ltr & 8 cy of encl rec'd--#10
Jan 7, 63	Ltr. 1-3-63 fm Marsh & McLennan trans: End. No. 22 to Policy No. NF-3, "Industry Credit Rating Plan Premi End," eff 4-16-57; issued 9-15-62 End. No. 23 to Policy No. NF-3, "Amendment of the Earned Premium End (Cal Years 57 thru 60)," eff 4-16-57; issued 9-15-62. (1 cy of ltr & 8 cys each encl.--#72)
Jan 7, 63	Ltr. 1-4-63 from Marsh & McLennan trans: Endorsement 27 to Policy NF-3--"Amendment of Description of Facility eff. 7-6-62, issued 12-17-62. (2 cys. ltr. & 8 cys. End. rec'd)
Jan. 14, 63	Ltr. 1-14-63 to UNC requesting copies of all endorsements, if any, to their current policy that they have not already submitted in order to aid us in keeping current on the proof of financial protection require by their license. (form ltr)

(cont'd)

APPLICANT 5 New Street, White Plains, N. Y.

DOCKET NO. 50-201

PCR: Low Power (5 watt) heavy water-moderated and reflected reactor (Pawling Research Reactor) & Pawling Lattice Test Rig (PLATR)
 SITE: AEC's Critical Facility Bldg. located at Pawling, N. Y.

DOCUMENTS

DATE DOCKETED	DESCRIPTION
Jan. 22, 63	<p>Ltr. 1-21-63 fm Marsh & McLennan trans the following in conn. w/UNC:</p> <p>End No. 25 to Policy NF-3 "Changes in Subscribing Companies..." eff 1-1-63; and</p> <p>End No. 26 to Policy NF-3 "Advance Prem End Cal Year 1963," eff 1-1-63 (1 cy of ltr & 8 cys of each encl. rec'd--#569)</p> <p>Ltr. 9-11-63 to licensee advis. of 45-day prior submtl. for ACRS review items.</p>
July 31, 63	<p>Ltr. 7-29-63 fm UNC advising that if there is occasion to contact Hamilt on overall corporate licensing matters, his new address is UNC, P. O. Box 48, Centreville, Md. 21617...Also advising that this does not change the current addresses for any of UNC's divisional activities (licensing). #5367 (Also see 50-207, 70-13, -36, -371)</p>
Oct. 28, 63	<p>Ltr. 10-23-63 fm Marsh & McLennan trans:</p> <p>End No. 28 to Policy NF-3 "Address of NELIA End," eff 12-1-62;</p> <p>End No. 29 to Policy NF-3 "Stand Prem & Res Prem End Cal Yr 1962," eff 12-31-62. (1 cy of ltr & 8 cys of end. rec'd--#7197)</p>
Dec. 31, 63	<p>Ltr. 12-31-63 to UNC requesting that they submit proof of financial protection required by license for Cal Year 1964 as soon as possible. (form ltr)</p>
Jan 29, 64	<p>Ltrs. 1-27-64 fm Marsh & McLennan trans:</p> <p>End No. 30 to Policy NF-3--Changes in Subscribing Companies, eff 1-1-</p> <p>End No. 31 to Policy NF-3--Adv. Prem End Cal Yr/1964; eff 1-1-64. (1 cy of ltrs & 8 cys of ea end rec'd--#453, 454)</p>
Feb. 11, 64	<p>Ltr. 2-11-64 to UNC (form ltr) advising them of AEC-Army study of reactor operators... and inviting their comments on content or participation.</p>

APPLICANT United Nuclear Corp. & Sabre-Pinon
5 New Street, White Plains, N. Y.

DOCKET NO. 90-101

DOCUMENTS

DATE DOCKETED	DESCRIPTION
June 19, 64	Ltr. 6-19-64 to UNC trans the following which is a result of a 6-17-64 FR pu Amendment No. 2 to Indemnity Agreement No. B-16....for acceptance. Rule Change (as published in FR) (form ltr)
July 7, 64	Amendment No. 2 to Indemnity Agreement No. B-16 as accepted by Walto S. Hamilton (?). #3610
Aug. 7, 64	Ltr. 8-5-64 fm Marsh & McLennan trans: End No. 32 to Policy NF-3--"Stand. Prem & Res Prem End f/Cal Yr 1963," eff 12-31-63. (8 cys of end rec'd--4126)
Nov. 5, 64	Ltr. 11-4-64 fm Marsh & McLennan trans: End No. 33 to NF-3--"Amendment of Description of the Facility," eff 8-19-64 End No. 34 to NF-3--"Increase of Limit of Liability End," eff 8-19-64. End No. 35 to NF-3--"Amendatory End," eff 8-19-64. (8 cys of each end rec' #5157)
Jan. 13, 65	Ltr. 1-13-65 to United Nuclear req. most recent ends. to NF-3 in order that records on proof of financial protection are kept current.
Feb. 3, 65	Ltr. 2-2-65 from United Nuclear advising that End. 35 is last end. to NF-3; 36 and 37 are in process and will be sent to us when available. (1 cy)#418
Feb. 4, 65	Ltr. 2-2-65 fm Marsh & McLennan trans: End. No. 36 to NF-3--Changes in Subscribing Companies End. No. 37 to NF-3--Advance Premium Endorsement for CY 1965. (1 cy ltr. & 8 cys each end. rec'd)#424
Sept 17, 65	Ltr. 9-15-65 fm Marsh & McLennan trans: End No. 38 to NF-3 --Stand Prem & Res Prem End f/Cal Yr 1964, eff 12-31-64. #3079
Dec. 23, 65	Ltr. 12-23-65 to UNC trans the following for their review and acceptance which has been issued as a result of amendment to 10 CFR 140 published in the FR on 11-30-65, effective 1-1-66: Amendment No. 3 to Indemnity Agreement No. B-16 (form ltr)

(cont'd)

United Nuclear Corporation	
APPLICANT	DOCKET NO. 50-101
DOCUMENTS	
DATE DOCKETED	DESCRIPTION
Dec. 29, 1965	Ltr. 12-28-65 fm UNC returning Amend No. 3 to Indemnity Agreement No B-16 as accepted 12-28-65 by Walter A. Hamilton, Vice Pres - Admn., United Nuclear Corp. #4091
Jan. 12, 1966	Ltr. 1-10-66 fm Marsh & McLennan trans: End No. 39 to NF-3 --Changes in Sub. Companies, eff 1-1-66 End No. 40 to NF-3 --Adv Prem End f/Cal Yr 1966, eff 1-1-66 End No. 41 to NF-3 --Amend of Cond 4 End, eff 1-1-66. (8 cys of ea encl --#125) (responding to form 1 of 1-7-66 --cy in file)
Jan. 11, 1966	Ltr. 1-11-66 to UNC requesting early action on the indemnity fee in connection with Lic R-49 for which they were billed 9-15-65.
Feb. 10, 1966	Ltr. 2-8-66 fm UNC (to Controller) forwarding check in payment of indemnity fee covering Lic R-49 for the one year period Oct 22, 1965 through Oct. 21, 1966. (cc to Huard)
March 28, 1966	Ltr. 3-24-66 (NDEO-641) fm UNC advising that they plan to modify their critical facility at Pawling, N. Y. to permit measurements of light water moderated fuel lattices, etc.....and trans. the following for our <u>informal</u> review: UNC-NDEO-624 - "Amendment II to Pawling Lattice Test Rig (PLATR) Hazards Summary Report," dated 2-28-66..... (1 cy. ltr. & 2 encl. ---#900---SUPPL. ONLY)
May 13, 1966	Ltr. 5-11-66 fm UNC submitting the following for approval of Amend No. 2 to Lic R-49: UNC-NDEO-624 --(the same as above) relating to measurements of light water moderated fuel lattices. (1 of ltr & 2 cys of rpt rec'd --not notarized) #138
May 2, 1966	Ltr. 4-28-66 fm UNC requesting authorization to withdraw snm for use in the Pawling, NY critical facility.

(cont'd)

APPLICANT United Nuclear Corporation

DOCKET NO. 50-160

DOCUMENTS

DATE DOCKETED

DESCRIPTION

May 18, 1966

Ltr. 5-12-66 fm UNC superseding and amending their ltr of 5-11-66. (#1431 --not notarized)

June 3, 1966

Ltr. 5-31-66 fm UNC (NDEO-687) superseding and amending their 5-11 and 5-12-66 ltrs re planned modifications to their Pawling critical facility, and trans the following for our approval:

Report NDEO-624A (Revised) --"Amendment 2 to PLATR Hazards Summary Report," dtd 5-20-66 which constitutes Amend No. 5 to Lic R-49. (3 of ltr & 18 cys of encl rec'd notarized 6-1-66) #1604

June 8, 1966

Ltrs. 6-8-66 to Townsend and the SG trans cys of UNC's 5-31-66 filing.

July 6, 1966

Ltr. 7-6-66 to UNC trans SNM Draft authorizing allocation of 81.198 kgs of contained U-235under Lic R-49, as requested 4-28-66.

July 19, 1966

Ltr. 7-18-66 fm UNC ack our 7-6-66 ltr and stating that, in view of their tight schedule, they would appreciate anything we can do to make this material available to them at the earliest possible date. (1 cy --#2103) (Mr. Doulos advised Oak Ridge by phone 7-20)

August 8, 1966

Ltr. 8-4-66 fm Marsh & McLennan trans:

Endorsement No. 22 to RELIA Policy No. NF-3.

(1 cy. ltr & 6 cys. encl. rec'd.....#2291)

Aug. 11, 1966

Ltr. 8-11-66 to United Nuclear trans list of addtl information required in connection with the review of NDEO-624A(Revised), Amendment 2.

(cont'd)

United Nuclear Corporation	
APPLICANT	DOCKET NO. 50-101
DOCUMENTS	
DATE DOCKETED	DESCRIPTION
Sept. 26, 1966	<p>Ltr. 9-22-66 fm UNC trans the following as a reply to our 8-11-66 ltr in support of their 5-31-66 appl:</p> <p>Report --Supplement A (NDEO-770) to Amendment 2 to PLATR Haza: Summary Report, NDEO-524A, dtd 9-19-66, which contain:</p> <p>Appendix A --Technical Specifications for the UNC PLATR Appendix B --Answers to Questions (requested in 8-11 ltr)</p> <p>Dwgs: 16623 --Test Section Assembly/Type F 16624 --Test Section Assembly/Type V 16898 --Moderator Displacement Grid (1 of ltr & 18 cys of each encl rec'd -- 18 notarized of Suppl w/Seal & Signature) #2734</p>
Sept. 28, 1966	Ltr. 9-28-66 to Townsend and SG/PHS (HEW, Rockville) trans cy. of UNC's 9-22-66 filing.
Dec. 12, 1966	<p>Ltr. 12-8-66 fm Marsh & McLennan trans:</p> <p>End No. 43 to NF-3 -- Changes In Sub. Companies, eff. 1-1-67. End No. 44 to NF-3 -- Advance Premium Endorsement f/Cal Yr 1 eff 1-1-67. (1 cy ltr. & 8 cys. ea encl rec'd. -- #3510)</p>
Dec. 15, 1966	Ltr. 12-12-66 fm UNC requesting temporary license to permit receipt and storage of fuel rods containing up to 83.5 kg of U-235 in connection with light water lattice experiments to be performed in their Critical Facility at Pawling. #3529 (INFO ONLY)
Jan. 27, 1967	<p>Ltr. 1-27-67 to UNC trans:</p> <p>Amendment No. 5 to License R-49, dtd 1-27-67, which authorizes UNC (1) to convert its existing reactor to a light water moderated reactor so that measurements can be made of various lattice parameters for slightly enriched oxide fuel rods in light water environment, (2) to receive, possess and use up to 5500 kilograms of uranium containing up to 150 kgs of U-235 in connection with operation of the reactor and (3) incorporate tech specs in the license.</p> <p>Related Notice, dtd 1-27-67. Safety Evaluation, dtd 1-27-</p>

APPLICANT United Nuclear Corporation

DOCKET NO. 50-101

DOCUMENTS

DATE LOCKETED	DESCRIPTION
Jan. 16, 1967	<p>Ltr. 1-16-67 to UNC trans:</p> <p>Amendment No. 4 to Indemnity Agreement No. B-16, which indemnifies the actions authorized by License SNM-993 for their review, and acceptance.</p> <p>License SNM-993.</p>
Jan. 25, 1967	<p>Amendment No. 4 to Indemnity Agreement No. B-16 as accepted by William F. Roche. #267</p>
Jan. 27, 1967	<p>Ltrs. 1-27-67 to the following trans cys of Amendment No. 5, Notice, and Safety Evaluation:</p> <p>Chairman, County Board of Supervisors SG/PHS (HEW, Rockville) Townsend, OASD</p>
Jan. 30, 1967	<p>Ltr. 1-30-67 to OFR trans Notice of Issuance of Facility License Amendment for publication.</p>
Feb. 20, 1967	<p>FR Notice of Issuance of Facility License Amendment filed w/FR 2-2-67; published 2-3-67; Citation 32 F.R. 2390; AD: None (15 day post intervention)</p>
Feb. 27, 1967	<p>Ltr. 2-23-67 fm Marsh & McLennan Inc. trans the following:</p> <p>End No. 45 to NF-3 --Standard Premium and Reserve Premium Endorsement f/Cal Yr 1966, eff 12-31-66 (1 cy ltr. & 8 cys. encl. rec'd. --#439)</p>

(cont'd.)

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT United Nuclear Corporation DOCKET NO. 50-101

DOCUMENTS

DATE DOCKETED	DESCRIPTION
July 21, 1967	Ltr, 7-20-67, fm Marsh & McLennan trans the following: <u>End. #47 to NF-3-</u> Reserve prem. refund end. f/cal yr 1967 effective 7-1-67(1 cy ltr, 8 cy encls rec'd #2416
August 4, 1967	Ltr, dtd 7-31-67, fm Marsh & McLennan trans: <u>Endorsement No. 46-</u> Amendment of 1967 Advance Premium End. under NELIA Pol. No. NF-3 effective 1-1-67 (8 cys of endorsement rec'd.....#2576)
August 25, 1967	Ltr, 8-21-67, fm Marsh & McLennan trans the following: <u>Endorsement No. 48</u> of NELIA Pol. NF-3- Amendment of Address Endorsement, eff. 7-17-67. (1 cy rec'd.....#2825)
Nov. 20, 1967	Ltr, 11-20-67, to UNC trans SNM Lic. and cy of <u>Amendment No. 5</u> to Indemnity Agreement No. B-16 to be signed & returned.
Dec. 4, 1967	Ltr, 11-30-67, fm UNC returning signed and accepted cy of <u>Amendment No. 5</u> to Indemnity Agreement No. B-16 as requested in ltr of 11-20-67. (1 cy rec'd.....#3914)
Dec. 12, 1967	Ltr, 12-7-67, fm UNC trans signed and accepted cy of <u>Amendment No.6</u> to Indemnity Agreement N o. B-16 as req in ltr of 12-2-67. (1 cy rec'd.....#4024)

FOR INTERNAL USE ONLY

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT	United Nuclear Corporation	DOCKET NO. 50-101
DATE DOCKETED	DESCRIPTION OF DOCUMENTS	
Jan 24, 1968	<p>Ltr 1-22-68 fm Marsh & McLennan trans the following:</p> <p>End #49 to NF-3-Changes in subscribing Co's eff 1-1-68 End #50 to NF-3-Adv & Std Prem Notice eff 1-1-68 End #51 to NF-3 Adt of Description of facility End #52 to NF-3 Std Prem & Reserve Prem</p> <p>(1 cy ltr & 8 cys encls rec'd.....#244)</p>	
April 15, 1968	<p>Ltr, dtd 4-10-68 fm UN pursuant to the req. of Lic R-49 reporting the observation of an overall moderator temperature coefficient at variance w/the req. of the tech spec.....</p> <p>(1 orig ltr rec'd.....#1330)</p>	
June 10, 1968	<p>Ltr, dtd 6-5-68, fm Marsh & McLennan trans the following:</p> <p>End No. 53 to NELIA Policy NF-3</p> <p>(1 cy ltr rec'd; 8 cys end rec'd.....#2117)</p>	
June 13, 1968	<p>Ltr, dtd 6-12-68 fm United Nuclear in ref to Lic R-49 and trans the following:</p> <p>AMENDMENT NO. 6 to LIC R-49 of the Pawling Lattice Test Rig and Amend # to PLATR SAR Operation w/PuO₂ UO₂ Fuel UNC-5216</p> <p>(1 ltr rec'd, 3 Not. Amend 17 conf'd cys rec'd.....#2148)</p>	
Jun2 14, 1968	<p>Ltr, dtd 6-12-68 fm United Nuclear submitted as ANNUAL REPORT& describing changes in the Pawling Lattice Test Rig and trans:</p> <p>Figure 1, Revised Poison Water System</p> <p>(1 orig ltr, 1 encl rec'd.....#2159)</p>	
July 11, 1968	<p>Ltr dtd 7-8-68 fm Marsh & McLennan, Inc. trans:</p> <p>Ltr fm Marsh & McLennan to United Nuclear encl check rep the return allocation of the reserve premium for policy calendar year 1958</p> <p>(1 cy rec'd.....#2486)</p>	

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BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT United Nuclear Corporation		DOCKET NO. 50-101
DATE DOCKETED	DESCRIPTION OF DOCUMENTS	
Sept 11, 1968	Ltr, dtd 9-11-68, to United Nuclear Corporation trans the follow: <u>AMENDMENT NO. 6 TO FACILITY LIC R-49</u> , which authorizes the licensee to receive, possess, and use in the Pauling Lattice Test Rig up to 7 kilograms of plutonium in a mixture of plutonium dioxide-uranium dioxide in accordance with your application for amendment submitted 6-12-69	
Sept 16, 1968	Ltr, dtd 9-16-68, to OFR trans an orig and two cert cys of Notice of Issuance of Facility License Amendment	
Sept 19, 1968	Ltr, dtd 9-19-68 to SG/HEW trans UNC ltr of 6-12-68 req lic amend and ltr to UNC, dtd 9-11-68 granting same.	
Sept 20, 1968	Ltr, dtd 9-20-68, to County Bd of Supervisors of Dutchess County trans Amend No. 6 to R-49, Federal Register Notice, and the Safety Evaluation.	
Sept 23, 1968	FEDERAL REGISTER NOTICE, dtd 9-23-68, Notice of Issuance of Facility License Amendment...Citation: 33 FR 14242.... DF: 9-19-68...DP: 9-19-68 AD: None	
Sept 24, 1968	Ltr, dtd 9-24-68, to New York State Dept of Commerce trans Amend #6 to R-49, Federal Register Notice, Safety Evaluation, and UNC's ltr of 6-12-68 requesting same.	
Sept 30, 1968	Ltr, dtd 9-30-68, to recipients of amend #6 to License enclosing corrected Attachment A	
Sept 30, 1968	Ltr, dtd 9-30-68, fm Compliance Region II trans: CO Report No. 50-111/68-2 reporting on the inspection of Sept 11-12, 1968.	
Oct 29, 1968	Ltr, dtd 10-29-68, to United Nuclear trans Form AEC-592	
Nov 14, 1968	Ltr, dtd 11-8-68, fm United Nuclear trans as reply to Form AEC-592	

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BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT		DOCKET NO.
United Nuclear Corporation		50-101
DATE DOCKETED	DESCRIPTION OF DOCUMENTS	
Dec. 2, 1968	Ltr. 12-2-68 to UNC advising that during the period of Aug. 12-19, 1968, a safeguards inspection of the snm held pursuant to SNM-871, R-49 and CX-25 was conducted..... and trans: "Report on the Inspection of Safeguards Control of Nuclear Materials of UNC" (See 70-903 and 50-290 also)	
March 6, 1969	Ltr. 3-3-69 fm UNC trans: Endorsements 54 thru 61 to NF-3 (1 cy. ltr. & 8 encl.----#775)	
June 24, 1970	Ltr. 6/18/70 fm UNC trans. the following in reply to our 6/8 ltr. Endorsement Nos. 1 thru 7 and 62 thru 64 to Policy No. NF--3 (1 cy. rec'd-----#1853)	
Jan 11, 1971	Ltr 1-4-71 fm UNC trans the following: Endorsement No. 67 to NELIA Policy No. NF-3 (1 cy ltr & 8 cys encl rec'd.....#74)	
June 23, 1971	Ltr 6-23-71 to UNC adv that explosives in a reactor facility must be evaluated carefully because of the potential for damage to the reactor	
Continued		

FOR INTERNAL USE ONLY

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT: United Nuclear Corporation

DOCKET NO. 50-101

DATE DOCKETED	DESCRIPTION OF DOCUMENTS
June 30, 1971	<p>Ltr 6-29-71 fm UNC notarized adv Gulf Oil & UNC will form a joint venture corporation commencing business as Gulf United Nuclear Fuels Corp and trans:</p> <p>ATCHEMT "A"- Partial Organization Chart ATCHEMT "B"- Resume of Arnold R. Fritsch ATCHEMT "C"- Resume of Kenneth L. Wiley List of Principal Officers 1970 Annual Fin Rpt for UNC & Gilf Oil</p> <p>(3 signed Orig & 19 conf'd cys, 22 cys encl rec'd, and 7 cys Annual Rpt.....#2986)</p>
July 7, 1971	<p>Ltr 7-1-71 fm UNC notarized req trans of lic R-49(50-101, & CX-25(50-290).....be trans to GUNFC in accord with UNC ltr dtd 6-29-71</p> <p>(3 signed & 19 conf'd cys.....#3040)</p>
July 7, 1971	<p>Ltr 7-1-71 fm GUNFC notarized 7-1-71 req trans of lic R-49 (50-101) & CX-25 (50-290) in accord with UNC ltr dtd 6-29-71...</p> <p>List of Directors of Gulf United Nuclear Fuel Corp.</p> <p>(3 signed & 19 conf'd.....#3049)</p>
Aug. 2, 1971	<p>Ltr 7-22-71 fm United Nuclear Corp notarized 7-22-71 re their 6-29-71 & 7-1-71 ltr....furnishing addl info in support of requests & trans the following:</p> <p>(1) Gulf United Nuclear Fuels Corp Pro-Forma Balance Sheet as of 3-31-71..... (2) Lease Agreement w/attchmt's Exhibit A & B.....</p> <p>(3 signed & 19 conf'd cys of ltr & 22 cys ea encl rec'd.....#3484)</p>
Oct. 29, 1971 INPLT	<p>Ltr 10-28-71 fm GUNFC notarized 10-28-71 requesting TERMINATION OF LIC. R-49...& trans the following:</p> <p>REPORT: Radiation Survey of PLATR</p> <p>(3 signed & 22 conf'd cys of ltr & 25 cys encl rec'd.....#4730)</p>

FOR INTERNAL USE ONLY

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT: United Nuclear Corporation

DOCKET NO. 50-101

DATE DOCKETED	DESCRIPTION OF DOCUMENTS
Dec 15, 1971	Ltr 12-15-71 to UNC adv that we would appreciate an early decision as to the disposition that wish to be made of their request of 10-28-71
Jan 17, 1972	Ltr 1-13-72 fm GUNFC re our 12-15-71 ltr....req that joint appl of Gulf United Fuels Corp & United Nuclear Corp for transfer of license R-49 & CX-25 be continued to be processed... (1 Orig.....#260)
Feb 17, 1972	Ltr 2-8-72 fm GUNFC notarized 2-8-72....request joint appl of GUNFC & UNC be treated as a Class 104 license (3 signed notarized & 19 conf'd.....#800)
Mar 13, 1972	Ltr 3-9-72 fm UNC re ply to our 10-5-71 ltr request for info on past experience with annual levels radioactivity (1 signed Orig & 10 cys encl rec'd.....#13)
Apr 25, 1972 ***	Ltr 4-25-72 to UNC trans Amdt #2 to License No. CX-25; Amdt # 7 to License No. R-49; Amdt No. 11 to Indemnity Agreement No. B-16 and Federal Register Notice
Nov 9, 1972 ***	Ltr 11-6-72 fm GUNF adv Mr. Robert Kopp is responsible for all correspondence and req all communications be directed to Mr. Kopp at the address given.... (8 cys rec'd.....#6167-)
Nov 20, 1972 ***	Ltr 11-6-72 fm GUN notarized 11-6-72 req an AMDT to Lic R-49 in order to change in status of PLATR..... (3 signed ltr.....43 cys rec'd.....#63)
Dec 21, 1972	Ltr 12-21-72 to GUNF in response to 11-6-72 ltr and adv that fees of \$1,500 & \$3,500 are due and should be remitted promptly

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

APPLICANT: United Nuclear Corporation

DOCKET NO. 50-101

DATE DOCKETED

DESCRIPTION OF DOCUMENTS

June 12, 1973

Ltr 6-8-73 fm GUNFC notarized 6-8-73 furnishing info re appl to amend facility license R-49 replacing 11-6-72 submittal (NISM-72-92) & trans Appendix A to Lic. No R-49 - Tech Specs for GUNFC Pawling Lattice Test Rig dtd 6-8-73.

(3 signed orig.....40 cys encl rec'd.....#3793)

June 27, 1973

Ltr 6-27-73 to UNC ack ltr dtd 6-11-73 reporting suppl info on exposures reported in ltr dtd 3-22-73

Oct 11, 1973

Memo 10-11-73 to D.J.Skovhoit, AD-OR(L) fm H.D.Thornburg, Chief FSEB(L) conversion of Lic No R-49 & CX-25 fm oper to possession.

Oct 25, 1973

Ltr 10-23-73 fm GUNC notarized 10-23-73 adv AEC of their intent to terminate Lic Nos R-49 & CX-25 & to dismantle & decommission both the PLATR & PTF.....w/attached tables 1 thru 3.

(3 signed orig.....39 cys rec'd.....#7811)

Nov 5, 1973

Ltr 11-1-73 fm GUNFC notarized 11-1-73, re their 10-23-73 appl, furnishing info to Pawling Lattice Test Rig (PLATR) & Pawling Test Facility (PTF) dismantling Plan.

(4 signed orig.....39 cys rec'd.....#8009)

Nov 14, 1973

Ltr 11-14-73 to GUNFC re their ltr 10-9-73 in response to our 9-21-73 ltr informing us of steps taken to correct items of noncompliance.

Nov 21, 1973

Ltr 11-19-73 fm Gen Atomic Co notarized 11-19-73 req written consent to acquire by transfer fm Gulf Oil Corp all rights, title & interest, whether direct or indirect of Gulf in lic or appl for lic & trans.....

- (1) APP "A" lic or appl for lic which are held or have been made in name of Gulf or div of Gulf (GEES, GGAC, GUNFC & AGNS)
- (2) APP "B" info pertinent to ident of appl & general partners.

(3 signed orig.....28 cys rec'd.....#8385)

APPLICANT: UNITED NUCLEAR CORPORATION

DOCKET NO. 50-101

DATE DOCKETED

DESCRIPTION OF DOCUMENTS

Dec 5, 1973

Ltr 11-30-73 fm UNC re their 10-23-73 ltr & trans:

Ltr dtd 10-23-73 fm Gulf UNC to D. J. Skvoholt
adv AEC of plans to dismantle & decommission
both the PLATR & PTF reactors

(1 signed.....23 cys rec'd.....#8655)

Dec 18, 1973

Ltr 12-14-73 fm GAC re their appl dtd 11-19-73, with respect to
the transfer fm GOC of its right, title & interest in various
licenses & appls for licenses & trans the following:

Resolution of the Standing Committee of
the Partnership Committee adopted at a
mtg thereof held on 12-14-73

(1 signed....1 cy encl.....#9006)

Dec 20, 1973

Ltr 12-20-73 to GUNFC re appl dtd 10-23-73 & ltrs dtd 11/1 &
30/73 & trans Notice of Intent to Issue Order Authorizing Dismantling
of Fac. & SER

Jan 2, 1974

Ltr 12-26-73 fm GUNFC re our 11-30-73 ltr...adv that the Appl
does not intend to submit a security plan by 1-7-74...

(1 signed.....#55)

Feb 4, 1974

Ltr 2-4-74 to Warren R. Walworth re ltr 12-10-73, to Pre Nixon
re concern on the use of a certain "nuclear fuel testing site
(DR-6578)

Mar 8, 1974

Ltr 3-8-74 to UNC trans Amdt to Indemnity Agreement &
Amdt to 10 CFR Part 140

Mar 29, 1974

Ltr 3-13-74 fm GUNFC notarized 3-13-74, requesting termination of
lic nos R-49 & CX-25, trans the following:

Results of Radiological Survey of Critical
Facility Bldg - PLATR and PTF

(2 signed.....)

BETH-5 (3-65)

U. S. ATOMIC ENERGY COMMISSION

PAGE: 27

APPLICANT: UNITED NUCLEAR CORPORATION

DOCKET NO. 50-101

DATE DOCKETED	DESCRIPTION OF DOCUMENTS
Apr. 24, 1974 with with	Ltr to GNFC re the inspection conducted by Mr. Jerman on Apr. 9-11 and 15-16, 1974 at Pawling, New York of activities authorized by AEC Lic. Nos. SNM-871, R-49 and CX25 .
June 25, 1974 ***	Ltr 6-25-74 to GUNFC trans Lic Termination Order, Amdt #13 to Indemnity Agreement No. B-16.
July 16, 1974	Ltr 7-16-74 fm UNC trans Amdt #13 to Indemnity Agreement No B-16.
Aug 13, 1974 with	Ltr 8-13-74 to UNC adv hav not rec'd endorsements 75, 76, 77, 81 & 82 to NF-3.
Mar 21, 1975 with	Ltr 3-21-75 to GUNFC trans (1) Amdt to Indemnity Agreement, (2) Amdt to 10 CFR Part 140
May 2, 1975 with	Ltr 5-2-75 to UNC trans Amdt No. 13

UNITED NUCLEAR
CORPORATION
RESEARCH AND ENGINEERING CENTER

Chaker
R3
GRASSLANDS ROAD
ELMFORD, NEW YORK 10822
914 LYRIC 8-8000
WB

In reply refer
to: H&S-2394

December 23, 1970

Mr. Donald A. Nussbaumer
Fuel Fabrication and Transportation Branch
Division of Materials Licensing
United States Atomic Energy Commission
4915 St. Elmo Place
Bethesda, Maryland 20014

Ref: (1) Docket No. 70-903
(2) SNM-871
(3) LIC 64-2 (Revised) dated
December 5, 1966

Dear Mr. Nussbaumer:

This is a request to amend our license to permit the installation of two (2) additional chemistry glove boxes in the Plutonium Laboratory at Pawling (see Figure #3 of Reference #3). The new boxes will be attached to the existing wet chemistry box as shown in the enclosed figure (14A represents the existing wet chemistry box and 14B and 14C represents the new chemistry boxes). These three boxes will be treated as a single wet zone with a total mass limit of 250 gms. of Pu + U²³⁵. This increase in the physical size of zone 22 does not alter the conclusion of the interaction analysis previously submitted.

The Wet Chemistry Glove Box II (S-401) is being installed in the new low bay area of the Pawling Plutonium Laboratory. The glove box, shown as 14B in Figure 1, is part of the new installation designed to increase analytical chemistry capacity.

The Chemistry Box (S-401) is an air atmosphere glove box constructed of stainless steel and containing six 3/8-inch thick full-view safety-glass panels for the operating sides. The interior chamber is divided into two sub chambers separated by a 3/8-inch steel bulkhead; the sub chambers have the following dimensions:

The larger "right-hand" chamber is approximately 42" wide and 6' long. The smaller chamber is approximately 42" wide and 3' long. A 16-inch diameter hole with a gas-tight seal door located in the bulkhead provides communication between the chambers.

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Sixteen rings, serving as glove ports, are mounted on the glove panels to provide 8 operating stations. All interior metal surfaces are coated with liquid tile to resist chemical attack. The box is capable of being evacuated to a pressure of $-8''$ of water below ambient. The maximum helium leak rate is 1×10^{-5} std. cc He/sec.

The overall dimensions of the box are approximately 42" wide, 41" high, and 9' long. Access into and egress out of the box are through the following ports located at the ends of the box:

East End - one 8" transfer port

West End - one 16" transfer port
- one 4" sphincter port

Bottom - one 8"ouching port

All of the ports except the 8" ouching port are closed off internally with sealed doors. The 8" ouching port is closed off with an "O" ring sealed stainless steel plate screwed to the floor of the box. The glove box is interconnected to adjacent box, S-402 (Zone 14C) and S-307 (Zone 14A) by stainless steel transfer tunnels.

All gas lines penetrating the box walls are protected by absolute filters.

Penetrating the top of the box are stainless tubes for feeding batch quantities of liquids into the box. The external ends of the tubes are attached to outlets of closed glass or plastic supply bottles. The outlets are located at the bottom of the bottles so that the end of the tube is always under a head of liquid. The liquid supply into the box is controlled by two manual valves for each tube, one being located outside of the box and the other inside of the box at the free end of the tube. The bottles are located in racks permanently mounted on the top of the box. Replenishment of the liquids will be by filling the supply bottles without removing them from the rack.

The glove box will be used for the chemical analysis of samples containing plutonium. Typical operations expected to be performed in this box consist of

- 1) Dissolution of samples containing plutonium and uranium in mixtures of mineral acids;

- 2) Dissolution of samples containing uranium and plutonium by fusion techniques;
- 3) Electrometric determination of uranium and plutonium;
- 4) Colorimetric determination for nitrogen by a modified Kjeldahl distillation method
- 5) Halogen determination by pyrohydrolysis and solid state electrode detection;
- 6) Solvent extraction preparations for colorimetric analysis;
- 7) Colorimetric analysis for nickel; and
- 8) Solution concentration by distillation techniques.

The glove box has been designed to operate from the existing Plutonium Facility once-through air system.

The gas control system will automatically keep the pressure of the glove box at -0.5 to -1.0 " H_2O during normal operating conditions with a constant supply flow of 5 to 10 cfh.

Emergency conditions which the system will handle include a glove or pouching bag rupture. Should there be a complete rupture of a glove, the exhaust system will maintain an air inflow of 100 ft/min through an 8" glove port.

The operation of the glove box on the once-through system will be identical to that of the Wet Chemistry Box S-307 in the existing facility.

The pressure in the glove box will be sensed and controlled by the existing pressure control system. The existing system contains a glove box high pressure alarm.

If a vacuum source is to be used in the glove box the pump will be controlled by a pressure sensitive switch. This switch will sense excessive vacuum, disconnect power to the pump, and require a manual restart of the pump.

All of the electrical components of the laboratory gas systems are on the automatic start generator bus system and the loss of commercial electrical power would not present a hazardous condition.

All materials transferred into the box will be through the use of the sphincter port or transfer tunnels for adjacent boxes. All

materials transferred out of the box will be by pouching through the 8-inch transfer port and the transfer tunnels.

The Balance Glove Box (S-402) is being installed in the new low bay area of the Pawling Plutonium Laboratory. The glove box, shown as (14C) in Figure 1, is part of the new installation designed to increase analytical chemistry capacity.

The Balance Box (S-402) is an air glove box made of stainless steel and two 3/8-inch thick full-view safety-glass panels for the operating sides. Four rings, serving as glove ports, are mounted on the glass panels to provide two operating stations.

The box is capable of being evacuated to a pressure of $-8''$ of₅ water below ambient. The maximum helium leak rate is 1×10^{-5} std. cc He/sec.

The interior dimensions of the box are 42" wide, 41" high, and 4' long. Access into and egress out of the box are through the following ports located at the ends of the box:

West End

- a) one 16" pouching port - outside "O" ring sealed cover
- b) one 4" sphincter port - outside sealed cover

East End

- a) one 16" pouching port - couples to another glove box
- b) one 4" pouching port - outside "O" ring sealed cover

All of the ports are closed off with sealed doors.

All lines penetrating the box walls are protected by absolute filters.

The glove box will be used for the preparation, weighing and storage of samples for characterization of Pu materials.

The glove box has been designed to operate from the existing Plutonium Facility once-through air system.

The gas control system will automatically keep the pressure of the glove box at -0.5 to $1.0''$ H₂O during normal operating conditions with a constant supply flow of 5 to 10 cfh.

Emergency conditions which the system will handle include a glove or pouching bag rupture and a sudden reduction in pressure caused by a rapid unfolding of the 16" pouching bag.

The operation of the glove box on the once-through system will be identical to that of the boxes in the existing facility.

The pressure in the glove box will be sensed and controlled by the existing pressure control system.

The existing system contains the following alarm:

a. Glove box high pressure

Should there be a complete rupture of a glove, the exhaust system will maintain an air inflow of 100 ft/min through an 8" glove port.

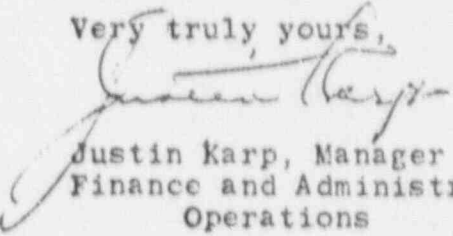
If a vacuum source is to be used in the glove box the pump will be controlled by a pressure sensitive switch. This switch will sense excessive vacuum, disconnect power to the pump, and require a manual restart of the pump.

All of the electrical components of the laboratory gas systems are on the automatic start generator bus system and the loss of commercial electrical power would not present a hazardous condition.

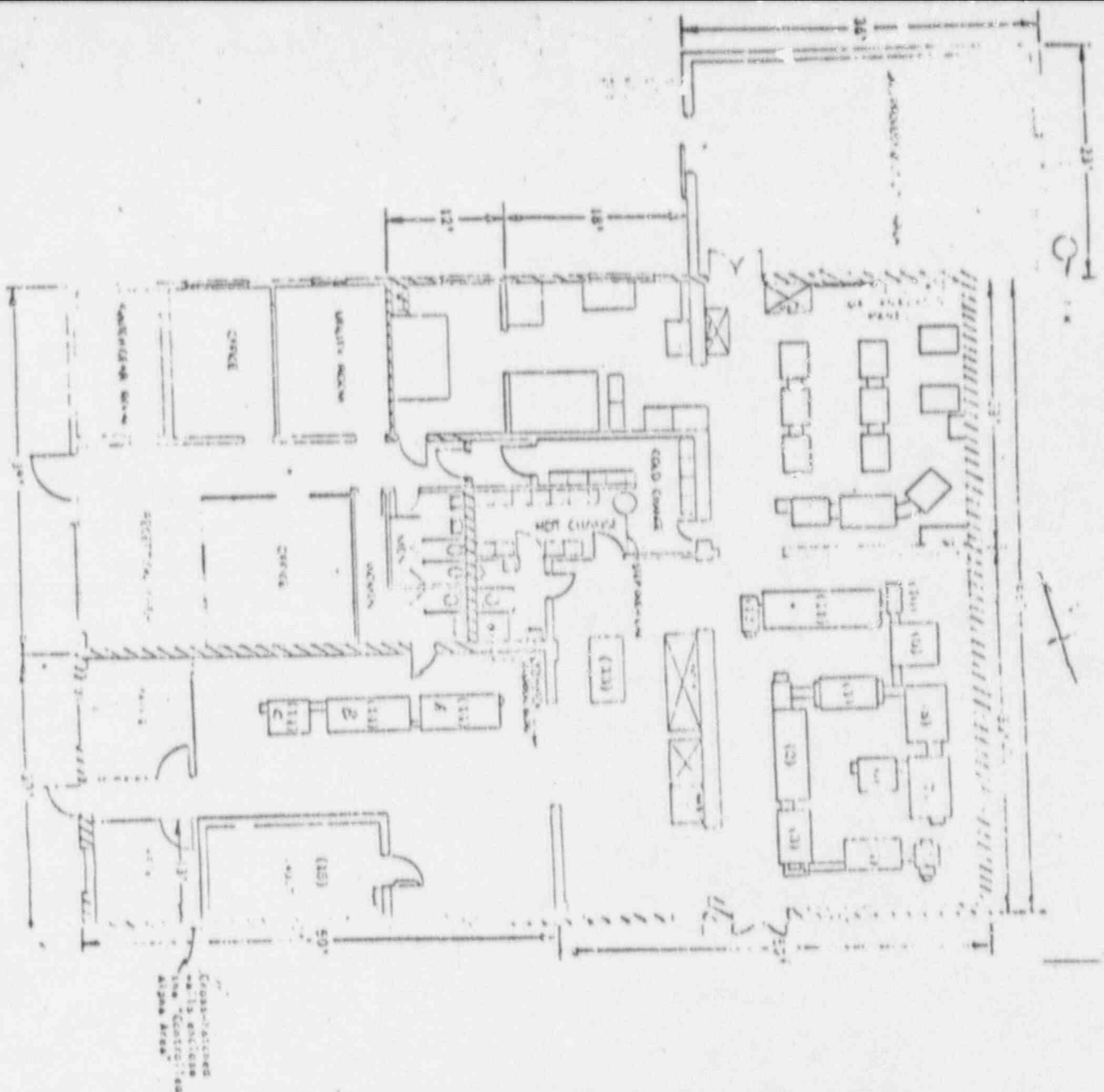
All materials transferred into the box will be through the use of the sphincter port or by standard laboratory pouching techniques. All materials transferred out of the box will be by pouching.

Your usual prompt consideration will be appreciated.

Very truly yours,


Justin Karp, Manager
Finance and Administrative
Operations

heb



Equipment	Count
(1) Blending	X
(2) Pilot Fabrication	X
(3) Pilot Furnace	X
(4) Grinding	-
(5) Cleaning	X
(6) Weighing	X
(7) Blood-suction/erase	-
(8) Dry-Stramplate	X
(9) Trays	X
(10) Padbox	-
(11) Slitter	X
(12) Slitter discharge	X
(13) Load and weld	-
(14) Analytical chemistry	-
(15) Storage	-

Cross-checked
alpha area
see "Control" on
Alpha Area

Fig. 1—Pawling Plutonium Laboratory

70-403



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

*Booker
Cowan
P.M.C.*

DEC 15 1969

DML:CEM
70-903
SNM-871

Amendment No. 71-6 ✓

48

General Atomic Nuclear Corporation
Research and Engineering Center
Masslands Road
Simsford, New York 10523

Attention: Mr. Justin Karp, Manager
Finance and Administrative Operations

Gentlemen:

Enclosed is Amendment No. 71-6 to Special Nuclear Material License No. SNM-871 authorizing the delivery of special nuclear material to a carrier for transport in the PNL Model 55 package.

Please note that this amendment does not authorize the transport of special nuclear material. Such transport is normally subject to regulation by the Department of Transportation (DOT). Questions regarding their requirements should be directed to DOT.

Sincerely,

Original Signed by
Donald A. Nussbaumer

Donald A. Nussbaumer, Chief
Source & Special Nuclear
Materials Branch
Division of Materials Licensing

Enclosure:
As stated

cc: Mr. William A. Brobst
Department of Transportation

DISTRIBUTION:

- Socket File, w/encl.
- Document Room, w/encl.
- State Health (License only)
- Compliance, HQ (2), w/encl. ← *Allo3*
- H. J. McAlduff, OROO, w/encl.
- R. Weber, SMI, w/encl.
- R. P. Wischow, NMS, w/encl.
- C. D. Luke, CB:DML, w/encl.
- N. Doulos, DML, w/encl.
- A. Cabell, DR:ADM, w/encl.
- Branch Reading File, w/encl.
- Division Reading File, w/o encl.

910319010

(7)

UNITED STATES
ATOMIC ENERGY COMMISSION

LICENSE AMENDMENT
for
DELIVERY OF SPECIAL NUCLEAR MATERIAL
to a
CARRIER FOR TRANSPORT

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, and Part 71, the following amendment to the special nuclear material license identified below is hereby issued, authorizing the licensee to deliver special nuclear material to a carrier for transport, and is subject to the conditions specified in that license and to the conditions specified below.

LICENSEE	
1. Name: United Nuclear Corporation Research and Engineering	3. License No. SNM-871 Amendment No. 71-6
2. Address: Center Grasslands Road Elmsford, New York 10523	4. Docket No. 70-903

CONDITIONS

5. (a) Packaging

(1) Model number

PNL Model 55

(2) Description

Containment vessel is a nominal 4" diameter Schedule 40 stainless steel pipe, 76 1/2" long, with a bolted and gasketed "grayloc" blind flange closure on one end and a seal welded plate on the other end. Containment vessel is centered and supported within an outer 18" x 18" x 81" steel angle framework by 3/16" thick steel support plates and 1" Schedule 80 pipes. The outer framework is covered by expanded metal mesh. Container is constructed in accordance with Pacific Northwest Laboratory Drawings H-3-26549 and H-3-26550.

(b) Contents

(1) Type and form
of material

Non-irradiated fuel rods containing PuO₂-UO₂ or UO₂ as ceramic pellets fully clad in leaktight stainless steel of minimum .015" thickness, zircalloy of minimum .020" thickness or other material of at least equivalent structural strength and thermal resistance. Uranium may be enriched to any degree in the U-235 isotope unless otherwise specified.

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COPY

LICENSEE: United Nuclear Corporation

PAGE NO: 2

LICENSE NO: SNM-871

AMENDMENT NO: 71-6

DOCKET NO: 70-903

(2) Maximum quantity of material per package

Total contents not to exceed 150 pounds and:

- (i) No more than 3 w/o PuO₂ in natural or depleted UO₂, or
- (ii) 2.7 kilograms fissile material with no more than 25 w/o PuO₂ in natural or depleted UO₂, or
- (iii) 1.0 kilogram fissile material.

(c) Fissile Class

II

(1) Minimum transport index to be shown on label for Class II

(i) For the contents described in 5(b)(1) and limited in 5(b)(2)(i) or 5(b)(2)(ii):

2.0

(ii) For the contents described in 5(b)(1) and limited in 5(b)(2)(iii):

2.5

REFERENCES

Licensee's application dated December 3, 1969, requesting approval to deliver special nuclear material to a carrier for transport in the PNL Model 55 package.

Battelle Memorial Institute's application dated August 21, 1969, and supplement dated September 26, 1969, Docket 70-984, requesting approval to deliver special nuclear material to a carrier for transport in the PNL Model 55.

FOR THE ATOMIC ENERGY COMMISSION

Date of Amendment DEC 15 1969

Original Signed by
Donald A. Nussbaumer

Donald A. Nussbaumer
Division of Materials Licensing



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

March 8, 1974

Donald J. Skovholt, Assistant Director for Operating Reactors, L

WITHHOLDING OF PROPRIETARY INFORMATION PURSUANT TO SECTION 2.790 FILED
BY GULF UNITED NUCLEAR FUELS CORPORATION RE DOCKET NO. 50-10, ET AL

By letter dated June 28, 1973, the Gulf United Nuclear Fuels Corporation (GUNFC) transmitted proprietary Report GU-5300 - "Gulf United Light Water Reactor Fuel Rod Thermal-Mechanical Analysis Methods" (dated June 25, 1973) and requested that the report be withheld from public disclosure pursuant to Section 2.790(b) of 10 CFR Part 2. By letters dated October 15, 1973, GUNFC transmitted a proprietary version of Revision 1 of GU-5300 and proprietary answers to questions asked in Mr. Stello's letter dated August 31, 1973 and September 4, 1973, regarding review of the June 1973 filing of GU-5300, and requested that they too be withheld pursuant to Section 2.790(b). With a letter dated November 7, 1973, GUNFC filed a non-proprietary version of Revision 1 of GU-5300. Both the non-proprietary and proprietary versions of Revision 1 are revisions in their entirety of the proprietary version transmitted by GUNFC's letter dated June 28, 1973. Since these versions superseded in its entirety the original report, the original report dated June 25, 1973, is being destroyed except for the Regulatory record copies in Docket Files 50-10 and 50-29 and those copies retained by Regulatory's Technical Review personnel. By letter dated June 26, 1973, Commonwealth Edison Company (CEC) also filed proprietary information on GUNFC fuel which was approved for withholding by AEC letter dated October 2, 1973. The non-proprietary version of the June 26th filing was submitted by CEC's letter dated August 21, 1973.

In its letters dated June 28 and October 15, GUNFC stated that the documents contain certain information which could enable a reload fuel supplier in competition with them to assess current GUNFC design and manufacturing methods and calculational results and to examine the test results performed by GUNFC at its own expense, and that disclosure of this information would result in a competitive and economic disadvantage to GUNFC.

(A) 112
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A/115

March 8, 1974

After reviewing the proprietary and non-proprietary versions of the documents and attempting to achieve an effective balance between legitimate concerns for protection of Gulf United's competitive position and the right of the public to be fully apprised as to the operation of light water reactors using GUNFC fuels and safety issues associated therewith, we have concluded that GUNFC has made a sufficient showing that its interest could be adversely affected by disclosure of the information contained in the proprietary documents. We also have concluded that sufficient information is contained in the non-proprietary versions filed with letters dated August 21, 1973 and November 7, 1973, and in other non-proprietary documents in the public record to advise an interested member of the public on the operation of light water reactors such as Dresden Unit 1 using GUNFC fuels and applicable safety considerations associated therewith.

Based on the above, I have concluded that disclosure of the proprietary documents transmitted by GUNFC letters dated June 28 and October 15, 1973, is not required in the public interest nor by 10 CFR Part 9, and they should therefore be withheld from public inspection pursuant to 2.790(b) of 10 CFR Part 2. A letter is being sent to GUNFC granting the June 28 and October 15, 1973, withholding requests.

Dennis L. Ziemann

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Directorate of Licensing

cc: Commonwealth Edison Company (50-10)
Yankee Atomic Electric Company (50-29)
Mr. Anthony Z. Roisman
Docket File
AEC PDR
Branch Reading
RP Reading
D. J. Skovholt
ACRS (16)
OIS
D. L. Ziemann
T. J. Carter
R. D. Silver
F. Burger
Technical Library (BETH)
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J. Shea
R. Reid
D. Ross
V. Stello
L. Rubenstein
S. Hanauer
R. Lobel



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

March 8, 1974

Docket No. 50-10

Gulf United Nuclear Fuels Corporation
ATTN: Mr. John Peak, Staff Consultant
Grasslands Road
Elmsford, New York 10523

Gentlemen:

The Commission's Regulatory staff has completed its review of your Report GU-5300 - "Gulf United Light Water Reactor Fuel Rod Thermal-Mechanical Analysis Methods" (dated June 25, 1973), Revision 1 of the report (dated October 15, 1973), and other associated items. Our evaluation is contained in the enclosed "Technical Report on Densification of Gulf United Nuclear Fuels Corporation - Fuels for Light Water Reactors", dated November 21, 1973. A copy of our evaluation and the non-proprietary Revision 1 of GU-5300 have been placed in the Commission's Public Document Room.

If Gulf United desires to discuss the results of our review, we will be happy to meet with your representatives.

Your letter dated June 28, 1973, transmitted a proprietary version of GU-5300 and your letters dated October 15, 1973, transmitted a proprietary version of Revision 1 of GU-5300 and proprietary answers to questions asked in Mr. Stello's letters dated August 31, 1973 and September 4, 1973, and requested that these items be withheld from public disclosure pursuant to Section 2.790(b) of 10 CFR Part 2. Your letter dated November 7, 1973, transmitted a non-proprietary version of Revision 1 of GU-5300.

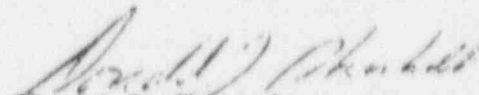
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March 8, 1974

The reasons for the withholding requests were stated to be that the subject proprietary documents contain design and manufacturing methods, and calculational results which were developed at the expense of Gulf United and their disclosure would result in a competitive and economic disadvantage to your Corporation. The Regulatory staff has examined the proprietary documents and has determined that they qualify for withholding from public disclosure. Accordingly, pursuant to Section 2.790(b), we are withholding these proprietary documents from public inspection. Withholding of this information from public inspection shall not affect the right, if any, of persons properly and directly concerned to inspect the documents.

Sincerely,


Donald J. Skovholt
Assistant Director
for Operating Reactors
Directorate of Licensing

Enclosure:
Technical Report dtd 11/21/73

cc w/enclosure:
Commonwealth Edison Company
ATTN: Mr. J. S. Abel
Nuclear Licensing Administrator -
Boiling Water Reactors
Post Office Box 767
Chicago, Illinois 60690

Yankee Atomic Electric Company
ATTN: Mr. Donald E. Vandeburgh
Vice President
20 Turnpike Road
Westboro, Massachusetts 01581

Mr. Anthony Z. Roisman, Esquire
Berlin, Roisman and Kessler
1712 N Street, N. W.
Washington, D. C. 20036

GENERAL ATOMIC COMPANY
P. O. BOX 81608
SAN DIEGO, CALIFORNIA 92138
(714) 453-1000



In Reply
Refer To: 871-484

October 9, 1974

Mr. L. C. Rouse, Chief
Fuel Fabrication & Reprocessing Branch No. 1
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: AEC License No. SNM-871; Docket 70-903

Dear Mr. Rouse:

In Mr. Peter Loysen's letter dated March 11, 1974, GAC requested that the Pawling, New York facility be deleted as an authorized place of use under the subject license. Deletion rather than termination was requested because of the subsequent transfer of authorization of the company's New Haven, Connecticut activities onto that license. Inasmuch as a request for termination of the licensed activities at New Haven has now been made, you should consider the original request as one for deletion or termination, depending upon whichever location you complete action on first.

With regard to soil sampling and analysis at Pawling, you are aware that two sets of measurements were made at different times at 15 separate locations on the site. The first set, made by General Atomic in October 1973, was used in the radiological survey report and showed no detectable Pu-238 and Pu-239. The second set, made by ATCOR in January 1974, was not available for use in the report and showed some positive but anomalous results. The anomalies appeared to be in the 239/238 ratios and more specifically, as was determined later, in the Pu-238 results themselves. With the exception of four selected sample locations and one other individual location, all of the other measurements from both sets were less than 1.0 d/m/gm Pu-239. We consider these other measurements to be reasonable and acceptable. Since no Pu-238 was ever used by itself at Pawling and no reason to suspect isotopic fractionation in soil, we must consider the Pu-238 results to be invalid.

As for the four selected sample locations, the ATCOR samples were re-analyzed by an AEC laboratory and found to be less than 1.0 d/m/gm Pu-239 with typical 239/238 ratios. Additional remeasurements of these locations by New York State Department of Environmental Conservation were found to be less than 1.0 d/m/gm also. Additional measurements of these locations by Regulatory Operations, Region I, were found to range up to 12.2 d/m/gm Pu-239. While we do not necessarily understand the reason for these higher values, we nevertheless decided to remove soil from the areas in question and to remeasure as described in Mr. Loysen's letter of August 12, 1974.

② ~~8002110368~~

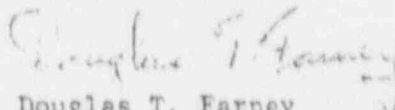
A/119 I

Resampling was performed on September 5, 1974 in accordance with procedures agreed to by Regulatory Operations, Region I, who monitored the sampling. Several samples of soil were composited for each of three areas located: (a) behind the Plutonium Laboratory Building; (b) below the windows of the E-Spec room; and (c) at a low spot off the paved area southwest of the Engineering Building. Results of the analyses performed on these samples are as follows:

	d/m/gm Dry Soil	
	<u>Pu-238</u>	<u>Pu-239+240</u>
Behind Pu Lab Bldg.	<0.002±.002	0.018±.004
Below E-Spec Windows	<0.002±.002	0.002±.002
Low Spot Off Paving	<0.002±.002	0.006±.002

We believe that these results demonstrate conclusively that the actions taken to further reduce residual contamination below your guidelines were effective and that all regulatory requirements have been met. Your prompt action to terminate SNM-871 will be appreciated.

Very truly yours,


Douglas T. Farney
Licensing Administrator
General Atomic Company

DTF/lm

REPORT OF INCIDENT
AT GULF UNITED'S PLUTONIUM FACILITY
AT PAWLING, NEW YORK

January 28, 1972

GULF UNITED
NUCLEAR FUELS CORPORATION
Elmsford, New York

A/86

~~9103190419~~

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1. INTRODUCTION

This report of an incident which occurred at Gulf United's Plutonium Facility located in Pawling, New York, on December 29, 1971, is being submitted in compliance with 10 CFR 20.495. The incident was reported immediately by telephone and telegram to the Director, Region 1, Division of Compliance, United States Atomic Energy Commission on December 29, 1971, in compliance with 10 CFR 20.403.

On December 29, 1971, at approximately 12:35 p.m., a pressure excursion occurred in three interconnected analytical glove boxes. The incident caused some uranium-plutonium oxide mixtures to be distributed in the portion of the laboratory where the glove boxes are located, resulting in plutonium contamination that exceeded the limits for release of radioactive materials as specified in 10 CFR 20.403. No fire resulted from the incident. No employees were present in the plutonium handling area at the time of the incident and, therefore, no individual was exposed to airborne plutonium activity or radiation. Our investigation shows that there was no release of plutonium to the environs. No equipment was damaged as a result of the incident; however, equipment contamination in this area was considerable. Decontamination is proceeding satisfactorily at this time, without further incident.

2. DESCRIPTION OF THE INCIDENT

At approximately 12:35 p.m. on December 29, 1974, a pressure excursion in three interconnected glove boxes (identified as S-202, S-203, and S-204 in Fig. 1) blew off a plastic pouch covering a 16-inch diameter port and expelled three sphincter cans with their original contents of loose $\text{UO}_2\text{-PuO}_2$ powder containing about 10.8 g of plutonium, about 30 empty plastic vials and friction caps, and about 8 Kimwipes onto the laboratory floor in the direction of the arrow shown on Fig. 1 of Appendix A. The airborne contamination alarm was sounded immediately by a continuous type air sampler located in the northeast corner of the Facility, called the Research Area. Two employees entered the change room immediately with face masks and observed visible evidence of the pressure excursion through the window of the main entrance door to the Research Area. The 16-inch plastic pouch cover for Box S-204, and several inner glove rings, were lying on the laboratory floor. The 16-inch plastic pouch, which had previously been rolled up and taped at the end of Glove Box S-204, was now projecting out from the box in the fully-extended, but collapsed, position. Glove Boxes S-202 and S-203 were not visible from the viewing location. No employees were in the plutonium handling area at the time of the incident. There was no evidence of fire.

Employees C and O suited up in coveralls and face masks entered the plutonium handling area carrying a portable beta-gamma survey meter. The 16-inch plastic pouch had been dislodged from Glove Box S-202 and was found lying on the floor along with the sphincter cans, plastic vials, Kimwipes, and fuel powder from the glove boxes. The employees closed the open 16-inch pouch port with the port cover and exited. Subsequently, the facility personnel were formed into de-

contamination teams, they suited up, and entered the plutonium handling area to remove the loose radioactive debris into waste barrels and to seal off the adjacent areas to prevent the spread of contamination.

Surveys were made of the entire Pawling Plutonium Facility, and its environs to assess the extent of contamination. The level of airborne plutonium activity in the Research Area shortly after the incident was $1 \times 10^{-9} \mu\text{C}/\text{ml}$ of air. The survey of the Research Area gave alpha contamination ranging from about 500 cpm to above the sensitivity of the meter of 500,000 cpm. The instrument survey results taken prior to any cleanup are shown in Table 1 of Appendix A. The results of a smear survey of the Research Area ceiling heat baffles and wall surfaces indicated that these surfaces were not significantly contaminated.

All other areas of the Pawling Plutonium Facility shown in Fig. 1 of Appendix A, with the exception of the Research Area and the emission spectrograph area, have been surveyed and found to be uncontaminated. A survey at the entrance of the emission spectrograph area shown in Table 1 of Appendix A indicated that the area was not significantly contaminated; however, a thorough survey will not be attempted until the radioactivity level in the Research Area has been further reduced.

Continuous monitoring of the Plutonium Facility exhaust stack and a survey of the Pawling site shows that no contamination was released to the environs. The contamination was contained, since the plutonium handling area operates at a negative pressure with respect to the environment, and because all lines that exhaust to the environment are protected by absolute filters.

A decontamination effort was organized and is in process. As of January 24, 1972, the smearable contamination was reduced to 2000 cpm maximum, and the fixed contamination to 27,000 cpm maximum. The airborne radioactivity was within acceptable limits of $2 \times 10^{-12} \mu\text{C}/\text{ml}$. An extensive monitoring program has been in effect since the incident occurred. Continuous air samples are collected in the plutonium handling area daily and outside of the Plutonium Facility on a weekly basis. The plutonium handling area is surveyed frequently. Bioassay samples (urine) and nasal smears are taken on a continuing basis. A continuing monitoring program of the site area is in progress to assure that plutonium is not released to the environment.

3. PERSONNEL EXPOSURES

No one was exposed to airborne concentrations of plutonium during the excursion since no personnel were present in the Laboratory at that time.

During subsequent inspection, cleanup and decontamination activities, however, concentrations in excess of the values listed in 10 CFR 20, Appendix B, Table 1, existed in the Research Area (see Table 2 of Appendix A of this report). Fifteen employees have been engaged in these activities for various periods of time. Exposures of the employees ranged from $0.01 \times \text{MPC}$ to $1.3 \times \text{MPC}$ for two consecutive seven-day periods of exposure as shown in Table 6, Column 2 of Appendix A. Exposures were calculated using the average concentration data of Table 2, the working time data of Table 5, and the respiratory protection factor for full-face respirators of 100 listed in 10 CFR 20, Appendix E. These estimates of exposure are felt to be conservative in view of the results of the nasal smear and bioassay program, as given in Appendix A.

Had they not worn full-face respirators, these personnel would have been exposed to from $1 \times \text{MPC}$ to $130 \times \text{MPC}$ for two consecutive seven-day periods. The theoretical exposure data are shown in Table 6, Column 1 of Appendix A. These theoretical exposures without full-face respirators were calculated using the average concentration data of Table 2 and the working time data of Table 5.

Each employee involved in decontamination was fully protected with special clothing described in Table 4 of Appendix A.

4. PROBABLE CAUSE

The three analytical chemistry glove boxes involved in the incident are identified as S-202, S-203, and S-204 in Fig. 1. Each one of the boxes is approximately 3 feet wide \times 4 feet long \times 3 feet high, and they are interconnected with 16-inch diameter tunnels. The 16-inch diameter ports of the end face of S-202 and S-204 are covered with a polyethylene bag used for pouching.

These three glove boxes draw air from inlet lines that are connected to a common manifold which draws laboratory room air. Each glove box inlet line is protected by an absolute filter.

The air exhaust lines from each glove box exit into a common manifold. The exhaust manifold is maintained at about -0.8-inch water column pressure differential by the Facility exhaust system. Air exits each glove box through its absolute filter into the exhaust manifold, then passes through a second absolute filter located in the Gas House, before exiting into the stack and finally to the environment.

Glove Box S-202 contains equipment for the determination of oxygen-to-metal (O/M) ratio in uranium-plutonium oxides by the gravimetric, oxidation-reduction procedure: a resistance heated furnace with sample retort, and a balance. In this procedure the weighed samples are placed in the retort and oxidized in air at 880°C, and then reduced with a reducing gas (normally 6% H₂-helium) at the same temperature. The reducing gas enters from a cylinder outside the box, passes through the furnace, and exits into the box at a point adjacent to the exhaust filter. The hydrogen content of gas mixtures used for this analysis is certified at Gulf United prior to use. The analysis of the mixture used prior to the incident was verified by an independent testing laboratory.

Glove Box S-203 contains equipment for the determination of carbon by the combustion-gravimetric technique: an induction-heated furnace and retort. The generator for the furnace and the gas absorption train are outside the glove box. The combustion gas (oxygen) enters from a bottle outside the box, passes through the furnace in the box, the absorption train outside the box, and vents back into the box line to exit through an exhaust filter.

Glove Box S-204 contains equipment used for the determination of moisture in uranium-plutonium oxides: standard analytical equipment using a P_2O_5 cell.

Only the O/M analysis setup in Box S-202 was in use at the time of the incident. UO_2 - PuO_2 samples were being heated up in the box atmosphere to be oxidized. The reducing gas was shut off.

The reducing gas normally used for the reduction step of the O/M analytical procedure is 6% H_2 -He. On December 27, 1971, however, this gas was replaced with a cylinder of 8.2% H_2 -Ar. According to Bureau of Mines Bulletin 503, "Limits of Flammability of Gases and Vapors," a hydrogen-helium mixture having less than 8.7% hydrogen will not burn when mixed in any proportion with air. Although such limit mixture data are not available for the case of argon as the diluent, data are presented in this reference which indicate: (1) hydrogen-nitrogen mixtures having more than 5.7% hydrogen will burn when mixed with air; and (2) the replacement of nitrogen with argon tends to decrease the limiting hydrogen concentration. Thus, while the 6% H_2 -He mixture is "always safe," the 8.2% H_2 -Ar forms a range of flammable mixtures with air. Using the nitrogen data in Bulletin 503, the flammable compositions range, as a minimum, from 48% of the argon-hydrogen mixture to 76% of the argon-hydrogen mixture.

On December 27 and December 28 the O/M procedure was conducted, and at the time of the incident on December 29, the procedure had been started. In addition, on December 28 a carbon analysis was conducted in the adjacent box, and the oxygen* used in that procedure exited into the Box S-202. The time records and flow rate information were reviewed to ascertain the quantities of the various gases which, in addi-

*Bulletin 503 data indicate introducing oxygen broadens the flammability range.

tion to make up air, were introduced into the Chemistry Box Line. These are given below.

<u>Date</u>	<u>Time</u>	<u>Gas</u>	<u>Estimated Total Volume, ft³</u>
12/27		8.2% H ₂ -Ar	36
12/28	From 11:00 a.m. to 4:15 p.m.	{ Air 8.2% H ₂ -Ar Oxygen	20 15 4
12/28 12/29	From 4:15 p.m. to 8:45 a.m.	8.2% H ₂ -Ar	89

Since the boxes are maintained at substantially constant pressure, a portion of each of these constituents left the box through the exhaust filter. However, by the time of the incident, the box atmosphere had evidently become sufficiently enriched in the hydrogen mixture to fall in the flammable composition range.

On December 29 the O/M furnace was turned on at approximately 11:30 a.m. The temperature of the furnace was observed to be approximately 400°C at 12:00 p.m. The normal heating rate of this furnace is such that a temperature in the range of 500 to 600°C would have been attained at 12:35 p.m., the time of the incident. This evidently ignited the mixture, causing the pressure increase which dislodged the pouch on the north end, allowing plutonium-bearing material to become airborne.

Assuming a composition resulting from mixing the gases introduced into Box S-202 from December 27, 1971 to the time of the incident, the maximum (adiabatic) pressure rise associated with burning of the mixture is calculated to be 35 psi. This exceeds the pressure rise required to dislodge the pouch.

The O/M furnace had also been operated with the argon-hydrogen mixture on the previous day, December 28, 1971, without incident. At the time that the furnace was shut off on that day (4:15 p.m.) however, an estimated total of 51 ft³ of the 8.2% H₂-Ar mixture had been introduced into the box, which was not sufficient to produce a box atmosphere in the flammability range.

5. CORRECTIVE ACTION

The following steps have been taken to prevent recurrence of this type of incident:

1. The reducing gas used in the O/M analytical procedure in Box S-202 will be restricted to 6% H_2 -He. Use of 8.2% H_2 -Ar in this procedure will be prohibited.
2. No substitution of another diluent for H_2 nor any increase in H_2 concentration will be permitted without a prior feasibility study documenting the safety of the proposed change.
3. The tunnel between the O/M box (S-202) and the carbon analysis box (S-203) will be permanently closed. No oxygen will be vented into Box S-202.
4. All other operations in the Plutonium Laboratory involving the use of either combustible gas or oxygen will be reviewed to prevent similar occurrences.
5. All stored plutonium-bearing powders will be kept in closed containers.

APPENDIX 4 - SURVEY RESULTS

INSTRUMENT SURVEY RESULTS

An instrument survey was taken of the Plutonium Facility Research Area on December 30, 1971 prior to any cleanup operation. The results of this survey are shown in Table 1. The survey location points are shown in Fig. 1.

RESTRICTED AREA AIR SAMPLE RESULTS

Air samples* are collected at five fixed locations in the Research Area of the Plutonium Laboratory and analyzed daily. Results of these samples covering the period December 29, 1971 (day of incident) until January 19, 1972 are shown in Table 2.

UNRESTRICTED AREA AIR SAMPLE RESULTS

Air samples are collected in the Plutonium Laboratory exhaust stack and at four outdoor locations and analyzed. Results of these samples covering the period of December 29, 1971 to January 21, 1972, are shown in Table 3. The locations of the air samplers are shown in Fig. 2.

PROTECTIVE GEAR

Each individual involved in the decontamination of the Plutonium Laboratory Research Area is attired as described in Table 4.

WORKING TIMES

Table 5 shows the time that each individual worked in the Plutonium Laboratory Research Area during the period of 12/29/71 to 1/11/72. This table is used for evaluation of exposures to airborne radioactive material.

PERSONNEL EXPOSURES

Personnel exposures to concentrations of plutonium in air for two 2-week periods beginning with the date of the incident are shown in Table 6. Exposures were calculated using data from Tables 1 and 5, and both with and without a respiratory protection factor of 100 (10 CFR Part 20, Appendix E).

*Continuous air sampler using Gelman glass fiber filter paper. Samples were measured for activity on a Nuclear Measurements Corporation Gas Proportional Counter, Model PC-3T. All samples were counted immediately after collection.

NASAL SMEAR RESULTS

Nasal smears are collected from each individual upon leaving the Research Area of the Plutonium Laboratory. The smears are counted on an NMC Model PC-3T gas proportional counter. The highest individual smear was 6 cpm.

URINALYSIS RESULTS

Daily urine samples are collected for each individual working in the Research Area of the Plutonium Laboratory. The samples are submitted to an independent laboratory for analysis.

Results reported for the period December 29, 1971 to January 4, 1972, show no concentrations in excess of 0.11 ± 0.05 dpm Pu/sample.

TABLE 1 — INSTRUMENT SURVEY* DATA FOR RESEARCH
 AREA OF PLUTONIUM FACILITY PRIOR TO CLEANUP
 ON DECEMBER 30, 1971

Research Area Section (See Fig. 1)	Location of Survey and Activity in cpm			
	<u>Floor</u>	<u>Top of Glove Box</u>	<u>Wall to 6-ft Level</u>	<u>Top of Pipes (13-ft Level)</u>
1	50,000	50,000	500	500
2	50,000	2,500	< 500	2,000
3	25,000	25,000	500	—
4	50,000	50,000	< 500	—
5	40,000	1,000	—	10,000
6	50,000	1,500	< 500	500
7	>500,000	500	<500	50,000
8	40,000	50,000	1000	40,000
9	>500,000	1,500	1500	750
10	500	—	—	—

*Instrument survey taken with an Eberline Instrument Corporation PAC-4G Alpha Counter.

TABLE 2 — AVERAGE AIR SAMPLE
 SURVEY DATA FOR RESEARCH AREA
 OF PLUTONIUM FACILITY

<u>Date</u>	<u>Concentration,</u> <u>μC Pu/ml Air</u>
12/29/71	1.0×10^{-10}
12/30/71	7.5×10^{-11}
12/31/71	3.0×10^{-9}
1/3/72	3.1×10^{-10}
1/4/72	8.9×10^{-11}
1/5/72	1.2×10^{-10}
1/6/72	2.5×10^{-11}
1/7/72	6.4×10^{-11}
1/10/72	1.9×10^{-12}
1/11/72	3.7×10^{-12}
1/12/72	9.0×10^{-12}
1/13/72	7.0×10^{-12}
1/14/72	2.0×10^{-12}
1/17/72	5.0×10^{-13}
1/18/72	1.8×10^{-12}
1/19/72	3.2×10^{-12}

TABLE 3 — ENVIRONMENTAL AIR SAMPLE SURVEY DATA

Period Ending on Date	Concentration, $\mu\text{C Pu/ml Air}$				
	Stack	Location A	Location B	Location C	Location D
12/29/71	3.4×10^{-15}	—	—	—	—
12/31/71	1.2×10^{-16}	3.2×10^{-15}	7.2×10^{-15}	1.3×10^{-15}	1.1×10^{-14}
1/7/72	$<1.0 \times 10^{-16}$	2.6×10^{-15}	2.2×10^{-15}	3.5×10^{-15}	2.2×10^{-14}
1/14/72	$<1.0 \times 10^{-16}$	1.5×10^{-14}	3.16×10^{-15}	1.5×10^{-15}	$<1.0 \times 10^{-16}$
1/21/72	5.2×10^{-15}	1.1×10^{-14}	1.66×10^{-14}	8.3×10^{-15}	4.5×10^{-14}

TABLE 4 — DESCRIPTION OF PROTECTIVE GEAR WORN BY
GULF UNITED PERSONNEL DURING DECONTAMINATION

1. Underclothing (socks, T-shirts, shorts).
2. Coveralls with openings sealed by masking tape.
3. Surgeon's gloves sealed to coveralls with masking tape.
4. Lab shoes covered with plastic bag, and openings sealed with masking tape.
5. Acid suit plastic pants and jacket, with openings sealed (including vent holes in jacket) with masking tape. Plastic boot over plastic bag covering shoes, with openings sealed by masking tape.
6. MSA full-face mask with No. 84305 filters.*
7. Neoprene gloves over surgeon's gloves, with glove opening sealed to plastic acid suit by masking tape.
8. Surgeon's cloth cap on head.
9. Plastic acid suit hood over cap.
10. Clear plastic bag enclosing mask and hood. Plastic bag sealed to plastic acid suit by masking tape.

*Filtration efficiency of 99.98% for 0.3-micron DOP smoke.

TABLE 5 — WORKING TIME OF ALL EMPLOYEES IN THE RESEARCH AREA (minutes)

<u>Employee</u>	<u>12/29/71</u>	<u>12/30/71</u>	<u>12/31/71</u>	<u>1/3/72</u>	<u>1/4/72</u>	<u>1/5/72</u>	<u>1/6/72</u>	<u>1/7/72</u>	<u>1/10/72</u>	<u>1/11/72</u>
A	105	80	130	135	120	90	110	—	150	110
B	195	—	—	135	120	145	110	145	145	155
C	90	80	105	101	100	—	105	95	—	145
D	—	95	85	115	140	125	105	130	120	100
E	90	—	—	—	—	—	—	—	—	—
F	105	—	90	70	110	110	110	95	—	—
G	90	105	125	—	100	120	120	100	120	155
H	—	100	85	60	—	105	105	95	115	—
I	—	95	90	120	—	145	95	135	140	190
J	90	—	—	—	—	—	—	—	—	—
K	105	80	—	65	115	110	90	145	90	—
L	—	—	—	85	115	105	120	100	105	90
M	—	—	—	85	140	60	95	125	120	90
N	—	80	120	97	—	—	—	110	120	—
O	5	—	—	—	—	—	—	—	—	—

TABLE 6 — EMPLOYEE EXPOSURES

Employee	Concentration, $\mu\text{C Pu/cc Air}$			
	First Week		Second Week	
	Without Protection Factor	With Protection Factor	Without Protection Factor	With Protection Factor
A	2.3×10^{-10}	2.33×10^{-12}	7.29×10^{-12}	7.29×10^{-14}
B	1.72×10^{-10}	1.72×10^{-12}	8.6×10^{-12}	8.6×10^{-14}
C	1.90×10^{-10}	1.90×10^{-12}	6.36×10^{-12}	6.36×10^{-14}
D	1.63×10^{-10}	1.63×10^{-12}	1.22×10^{-9}	1.22×10^{-13}
E	1.88×10^{-10}	1.88×10^{-12}	—	—
F	2.13×10^{-10}	2.13×10^{-12}	7.54×10^{-12}	7.54×10^{-14}
G	2.5×10^{-10}	2.5×10^{-12}	1.01×10^{-11}	1.01×10^{-13}
H	1.97×10^{-10}	1.97×10^{-12}	1.11×10^{-11}	1.11×10^{-13}
I	2.21×10^{-10}	2.21×10^{-12}	1.21×10^{-11}	1.21×10^{-13}
J	1.88×10^{-10}	1.88×10^{-12}	—	—
K	7.38×10^{-11}	7.38×10^{-13}	1.28×10^{-11}	1.28×10^{-13}
L	3.84×10^{-11}	3.84×10^{-13}	9.27×10^{-12}	9.27×10^{-14}
M	4.08×10^{-11}	4.08×10^{-13}	7.48×10^{-12}	7.48×10^{-14}
N	1.65×10^{-10}	1.65×10^{-12}	3.0×10^{-12}	3.0×10^{-14}
O	$2. \times 10^{-12}$	$2. \times 10^{-14}$	—	—

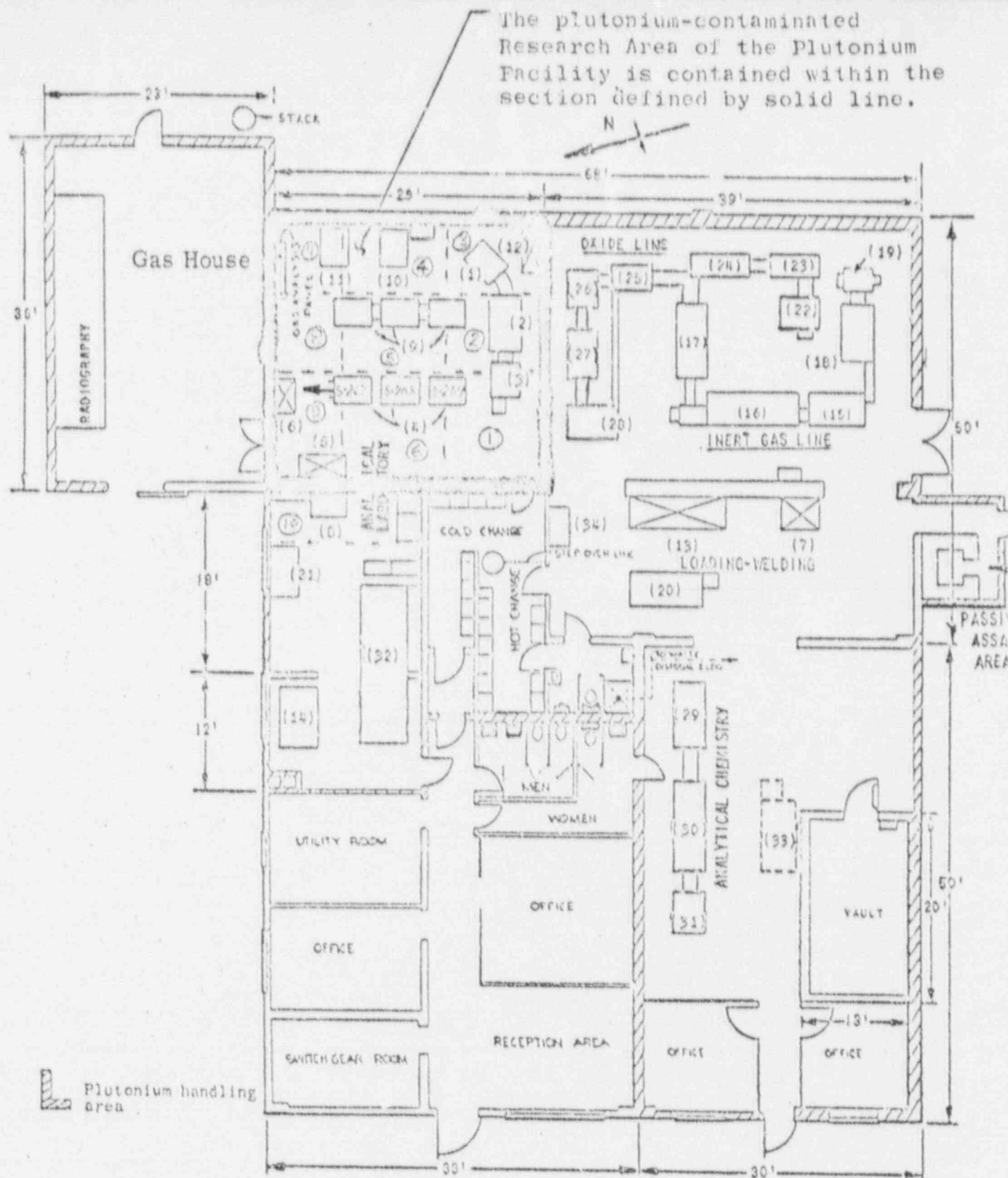


Fig. 1 — Layout of the Gulf United Nuclear Fuels Corporation Plutonium Facility, Pawling, N. Y.

⊗ Location of continuous air samplers

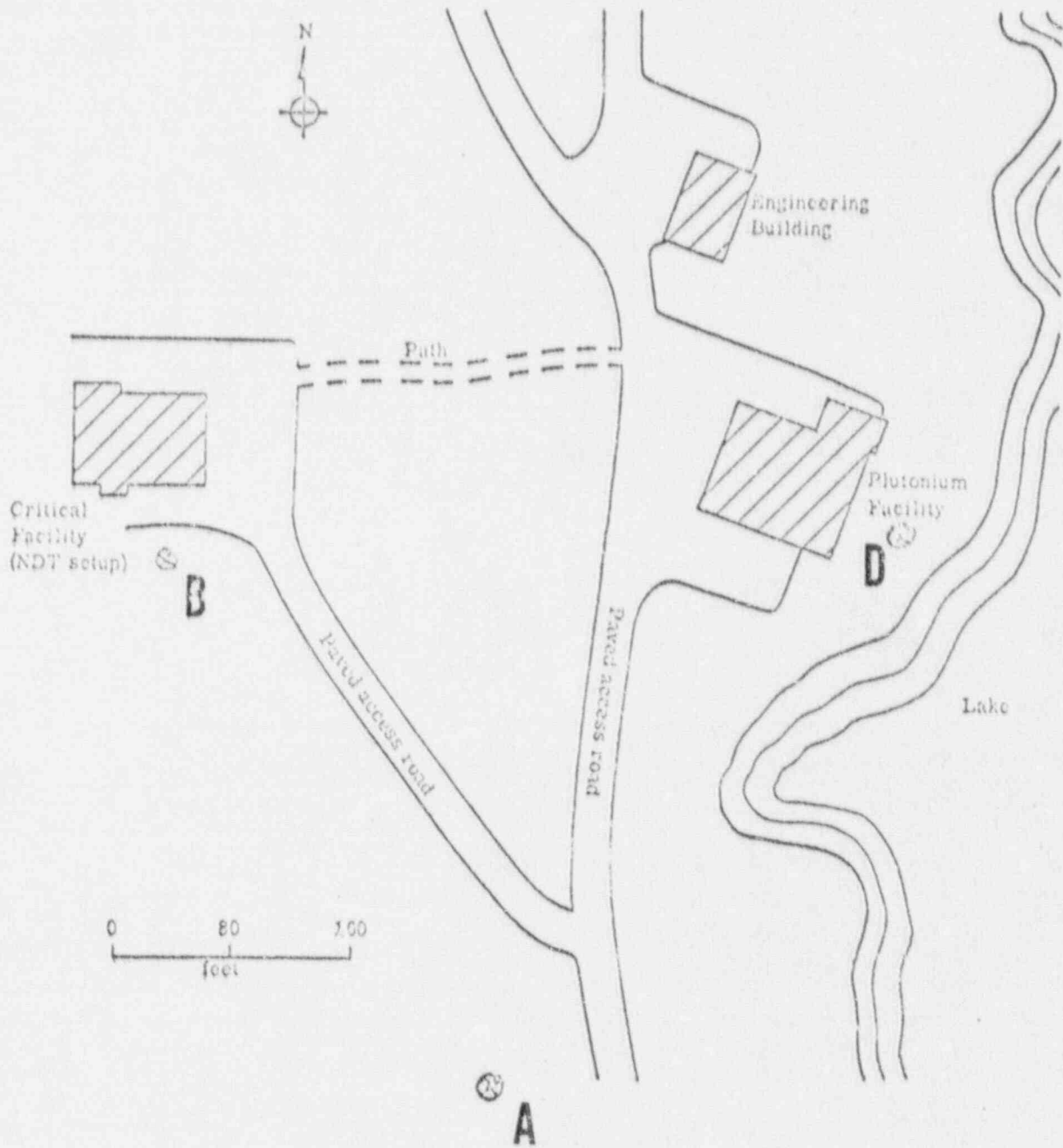


Fig. 2 — Site Plan — Pawling Facility

GULF UNITED
NUCLEAR FUELS CORPORATION

P. O. Box 606
New Haven, Connecticut 06503
203-777-7641

In Reply Refer To: RA:LM-73-42

MAR 28 1973

Mr. Leland C. Rouse, Chief
Fuel Fabrication and Reprocessing Branch
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: Section 800

Reference: AEC License No. SNM-871, Docket 70-903

Dear Mr. Rouse:

Attached is Section 800 to the referenced license as part of Gulf United Nuclear Fuels Corporation's revision to the renewal application for SNM-871. This Section is part of the demonstration portion of the license and describes the Eastview Facilities of the Elmsford Site. It shows how the technical specifications of Sections 300 and 400 were used to evaluate and establish the safety of these facilities as they now appear.

Sincerely,

Robert E. Kropp

Robert E. Kropp
Licensing Manager

REK:fg

~~9103200405~~

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REVISED SUBSECTION NUMBERS

<u>Revised Renewal Application</u>	<u>Replaces In Renewal Application LIC-64-3 (Revised)</u>	<u>Replaces In Approved License LIC-64-2 (Revised)</u>
Subpart 811	New	--
Subpart 812	New	--
Subpart 813	Section 11 - pp. 73-74 Appendix B - pp. 109-110	Section 11 - pp. 57-58 Appendix B - pp. 84-85
Subpart 814	Appendix B - pg. 111	Appendix B - pp. 84-85
Subpart 815	Appendix B - pg. 111	Appendix B - pp. 84-85
Subpart 821	New	--
Subpart 822	Section 2 - pg. 13 Section 4 - pg. 19	Section 2 - pg. 10 Section 4 - pg. 18
Subpart 823	Section 2 - pg. 14 Section 4 - pp. 20-21	Section 2 - pg. 10 Section 4 - pg. 18
Subpart 824	Section 2 - pg. 13	Section 2 - pg. 10
Subpart 831	Appendix D - pp. 159-160	--
Subpart 832	Appendix D - pp. 160-161	--
Subpart 833	Appendix D - pg. 161	--

Date: MAR 28 1973

Rev: 0

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800. Scope of Section

This Section is one of the demonstration portions of the license. It shows how the standards and criteria of Sections 300, 400, 500, 600 and 700 were used to evaluate the nuclear criticality safety, radiation safety, nuclear materials management, emergency planning and shipping and receiving functions of the facilities as they now appear. These demonstrations indicate how the technical specifications will be used to perform evaluations of future changes and modifications.

Case: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: _____

Subject: EASTVIEW FACILITIES - Scope of Section

Used: MAR 28 1973 Supersedes: New Approved: _____ Page 1 of 1

GULF UNITED

NUCLEAR FUELS CORPORATION

Section 800 - Eastview Facilities

Subsection 810 - Storage

SUBPART 811	OUTSIDE STORAGE
SUBPART 812	INSIDE STORAGE
SUBPART 813	BUILDING 2 VAULT
SUBPART 814	BULK STORAGE OF LOW- ENRICHMENT MATERIALS
SUBPART 815	STORAGE OF LOW-ENRICHMENT FUEL RODS

Revision: SIM - 871 Docket: 70-903 Section: 800 Subsection/Subpart: 810

Title: EASTVIEW FACILITIES - Storage - Table of Contents

Issued: MAR 28 1973 Supersedes: 5/30/72 Approved: _____ Page 1 of 1

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NUCLEAR FUELS CORPORATION

811. Outside Storage

SNM bearing materials may be stored outside the buildings of the Eastview Facilities within the fenced-in area if the SNM is in a shipping container. Arrays of containers will be stored as described in Subsection 703. Specifically, the following limitations will be employed:

1. Containers will be sealed and not opened in outside areas. Prior to opening, containers will be taken into a process, shipping-receiving or storage area.
2. Containers will be labeled such that their contents can be readily determined. These labels will be weather proof and will either list or reference appropriate internal documents which list the enrichment, quantity of SNM and other pertinent process and health and safety information.
3. SNM bearing liquids will not be stored outside. Acids and corrosive materials will be stored in containers which also meet the criteria of Title 49 CFR.
4. Containers will be stored on pallets to provide elevation off the ground.
5. During periods of high winds, containers will be either moved inside or secured by rope, chain, etc. to the ground or to building walls.
6. Containers and outside storage arrangements will be checked during routine inspections as per Subsection 207.

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 811

Subject: EASTVIEW FACILITIES - Storage - Outside Storage

Issued: MAR 28 1973 Supersedes: New Approved: _____ Page 1 of 1

GULF UNITED

NUCLEAR FUELS CORPORATION

812. Inside Storage

1. SNM may be stored in buildings in specified locations, in shipping containers. Arrays of containers will be stored as described in Subsection 703.
2. After unloading from shipping containers, SNM will be stored in storage areas or devices described in this Subsection.
3. In-process storage devices may be placed throughout the buildings to retain SNM during processing or between process steps. These devices are metal racks or concrete bunkers which provide spacing between safe cross section metal boxes or ports, or safe piece count batches.

Case: SNM-671 Docket: 70-903 Section: 800 Subsection/Subpart: 812

Subject: EASTVIEW FACILITIES - Storage - Inside Storage

Effective Date: MAR 28 1973 Supersedes: New Approved: _____ Page 1 of 1

GULF UNITED

NUCLEAR FUELS CORPORATION

813. Building 2 Vault

1. Description of Vault

The vault location is shown on Figure 7. It contains the Rod Storage Array, Bulk Storage Array and Archive Storage Array. Details of these storage arrays are shown in Sketch 813-I.

1.1 Rod Storage Array

The storage array for U-Pu rods is installed on the south wall of the Building 2 vault. It consists of a rack for storage of a single row of vertically disposed rods constructed of 1/2-in. steel plate, 36-in. high x 96-in. wide (in two sections). Two horizontal rows of pipe straps are fastened to each section. The rows of pipe straps are 27 in. apart and spaced to accommodate 1 1/4-in. pipe on 3-in. centers.

The rod storage thus consists of a flat array forming a slab of effective thickness ≤ 1.5 in. of fixed geometry.

1.2 Bulk Storage Array

The bulk storage array, installed on the north wall of the Building 2 vault, is designed for the safe storage of fissile materials of any enrichment, chemical form, or degree of moderation.

It consists of a fixed array of receptacles each 5 1/4-in. deep x 5 1/4-in. wide x 11 in. high with a horizontal surface-to-surface separation of 12-in. and a vertical surface-to-surface of 13 in. The rack is constructed of 16-gauge steel with a face plate which blanks out all areas except for the openings. A rear plate is bolted to the wall of the vault. Material is stored in cylindrical metal containers, limited to one container per receptacle.

Case: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 813

Subject: EASTVIEW FACILITIES - Storage - Building 2 Vault

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1.3 Archive Storage Array

The archive storage array is constructed on the west wall of the Building 2 Vault. It is designed for the storage of low enrichment (not exceeding 5 w/o U-235) rods with a maximum fuel length of 13 ft. Further details are shown on Sketch 813-II.

It will consist of a series of brackets welded to a vertical support which is attached to the wall. The rods will be supported horizontally and the overall dimensions of the array will not exceed 3-1/2" in thickness and 30" in height. Rods will be strapped or clamped into individual brackets to preclude their falling out.

1.4 Criticality Alarm System

This unit is mounted on the wall of the lab and is a gamma detector utilizing two Amperex 90NB-3 Geiger-Mueller tubes. The unit is capable of accepting three additional remote G-M detectors and these detectors are located throughout the facility. (See Fig. 7.)

This system satisfies the requirements of 10 CFR 70. A rise in the gamma background, as would be experienced during an accidental criticality, causes the alarm to sound, which requires the immediate evacuation of the area.

The criticality alarm has five rechargeable nickel-cadmium cells. During normal operation, the batteries are maintained fully charged by a 200-milliampere trickle charge from the low-voltage rectifier circuit. They begin to discharge only when a-c power fails. The operating time for the unit, if there is a power failure, is 10 hr under high limit alarm conditions, and 90 hr under nonalarm conditions.

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Subject: EASTVIEW FACILITIES - Storage - Building 2 Vault

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2. Nuclear Criticality Safety

2.1 Rod-Storage Array

The maximum safe loading of each rod can be computed on the basis of the homogenized slab corresponding to 3-in. spacing between adjacent rods and a maximum 1 1/2-in. thickness. From Fig. 4 of TID-7016, the maximum U-235 density for an isolated 1 1/2-in. thick slab with full reflector is 1.57 kg/liter, or 1.57 g/cm³. To convert this to permissible loading per foot, consider a unit cell containing a 1-ft length of rod. Its volume is 12 in. x 1 1/2 in. x 3 in. = 54 in.³ = 0.866 liter. Hence, making the conservative assumption that one gram of Pu-239 is equivalent to 4 grams of U-235, the permissible loading of the rod is:

$$(\text{Mass U-235} + 4.0 \times \text{Mass Pu-239}) \leq 1.57 \text{ kg/liter} \times 0.866 \text{ liter/ft.}$$

$$(\text{Mass U-235} + 4.0 \times \text{Mass Pu-239}) \leq 1.39 \text{ kg U-235 equivalent/ft.}$$

This restriction will ensure the safety of the isolated rod storage array.

2.2 Bulk Storage Array

Amended Table IV of TID-7016 indicates that for H/U-235 ratios greater than 20, a volume limit of 3.6 liters is always safe, and that for H/U-235 ratios less than 20 a mass limit of 3.6 kg U-235 is always safe. Therefore, a mass limit of 3.6 kg of U-235 or equivalent, and a cylindrical container volume limit of 3.6 liters are established for each storage receptacle.

The bulk storage array satisfies the requirement of Table IV of TID-7016 as cited above, and Table V of TID-7016 indicates that an isolated plane array of such units is safe for any number of units, provided that:

1. Spacing between unit containers is at least 8 in. surface-to-surface; and
2. Minimum center-to-center spacing of units is at least 16 in.

Since the bulk storage array satisfies both conditions, the array is safe.

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2.3 Archive Storage Array

The array is analyzed assuming that it is an isolated zone as would be the condition in case of flooding. Use is made of a series of diffusion theory calculations performed for the analysis of fuel rod storage in the Critical Facility and reported in NDEO-701 dated June 1966 (reference AEC License R-49, Docket 50-101).

Values of K_{eff} were calculated for semi-infinite fully reflected slabs of unclad fuel rods containing oxide fuel enriched to 5 w/o U-235 in U. A series of calculations in which rod diameter and water to fuel ratio were varied led to the conclusion that an infinite slab thickness of 9.75 cm was safe (i.e., $K_{eff} < .98$).

Performing a buckling conversion (using a reflected extrapolation length of 6.6 cm) to a 3.5 in. thick 30-inch wide slab (assuming infinite length) results in a K_{eff} value for the fully reflected system of 0.92. Thus, the proposed storage is safe against flooding.

The K_{eff} value for the bare system was calculated by assuming the same k_{∞} and M^2 values as for the reflected system and using a bare extrapolation length of 3.2 cm to calculate buckling values. The result for the optimally moderated system of unclad rods was 0.64.

2.4 Interaction

The K_{eff} values for all the units in the vault have been calculated under the assumption of double batching (where appropriate) and no reflector. Calculations were performed by a one-dimensional discrete ordinates code (DTF) except for the archive array which was calculated as described above. The results are as follows:

Bulk Storage Unit (double batched):	0.66
Rod Storage Array (double batched):	0.59
Archive Array:	0.64

According to Fig. 26 of TID-7016 (Rev. 1) an allowable solid angle for a k_{eff} value of 0.66 is 2.4 steradians.

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Solid angles have been calculated by the "point-to-plane" method listed on page 35 of TID-7016 (Rev. 1) and are:

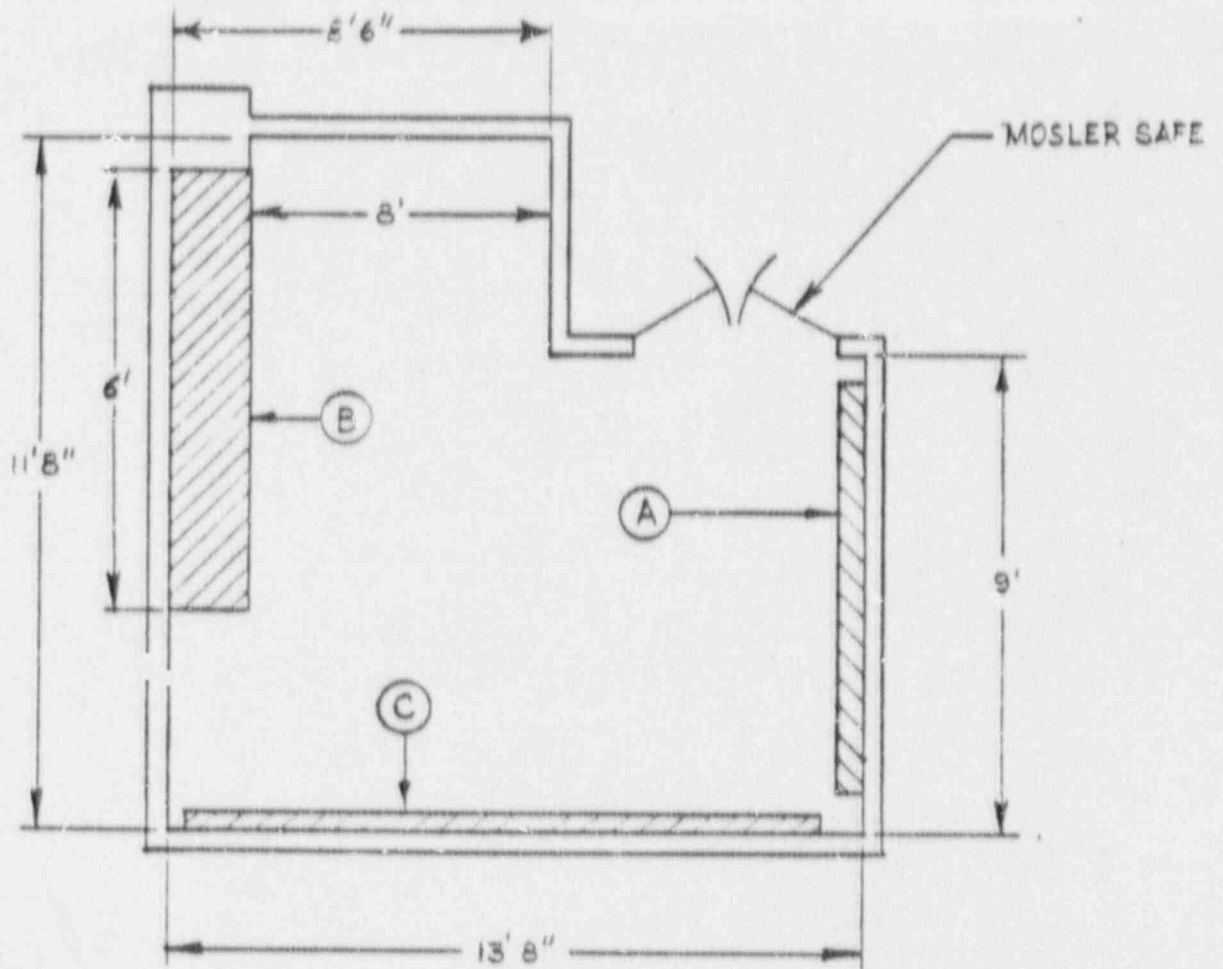
Case No.	Solid Angle Subtended By	<u>At the Center of</u>	
1	Bulk Storage Array	Archive Array	.14 steradians
	Rod Storage Array	Archive Array	.32 steradians
		Total	.46 steradians
<hr/>			
2	Archive Storage Array	Rod Storage Array	.56 steradians
<hr/>			
3	Other Bulk Storage Units	Central Bulk Storage Unit	.81 steradians
	Archive Array	Nearest Bulk Storage Unit	.19 steradians
		Total	1.00 steradians

The separation of the Rod Storage Array and the Bulk Storage Array meets the isolation criteria listed on page 27 of TID-7016 (Rev. 1) and thus may be considered as isolated from each other.

The maximum solid angle (1.0 steradian) is smaller than the allowable solid angle (2.4 steradians) so the storage arrangement is safe.

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- (A) — ROD STORAGE AREA
- (B) — BULK STORAGE AREA
- (C) — ARCHIVES STORAGE AREA

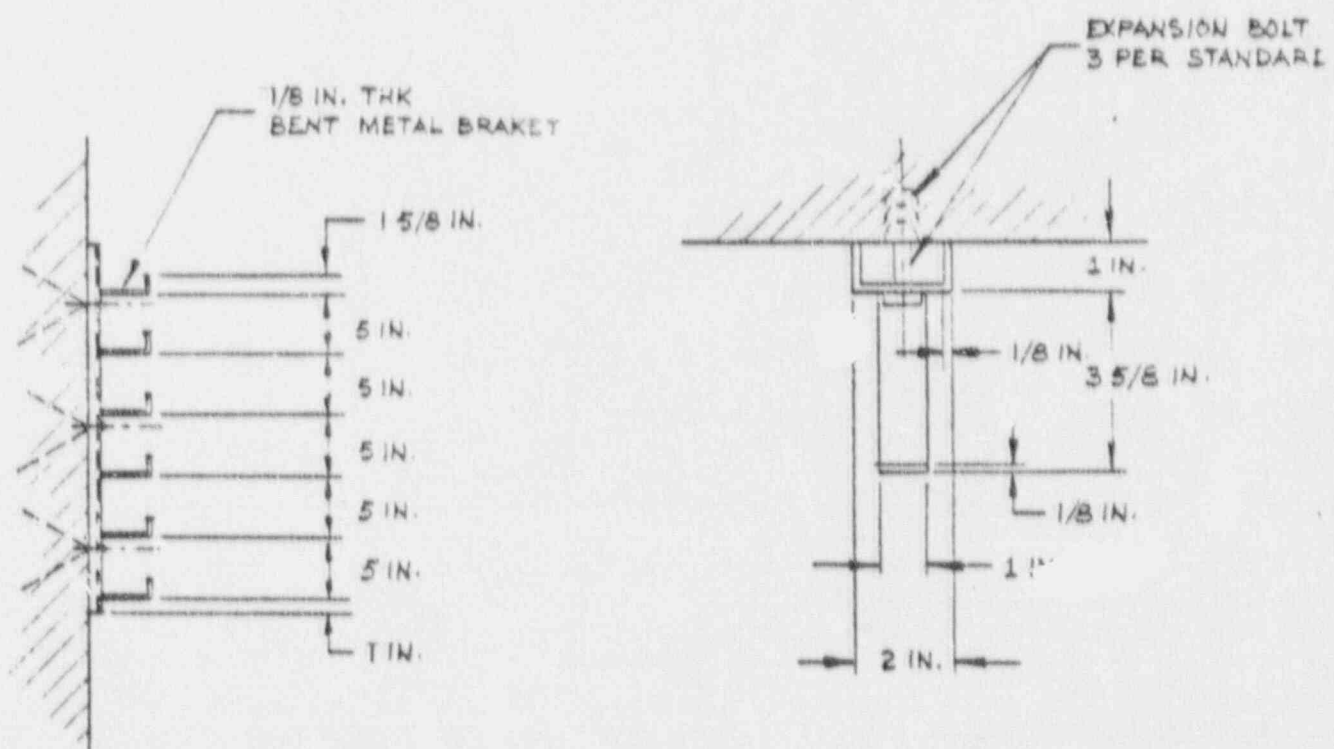
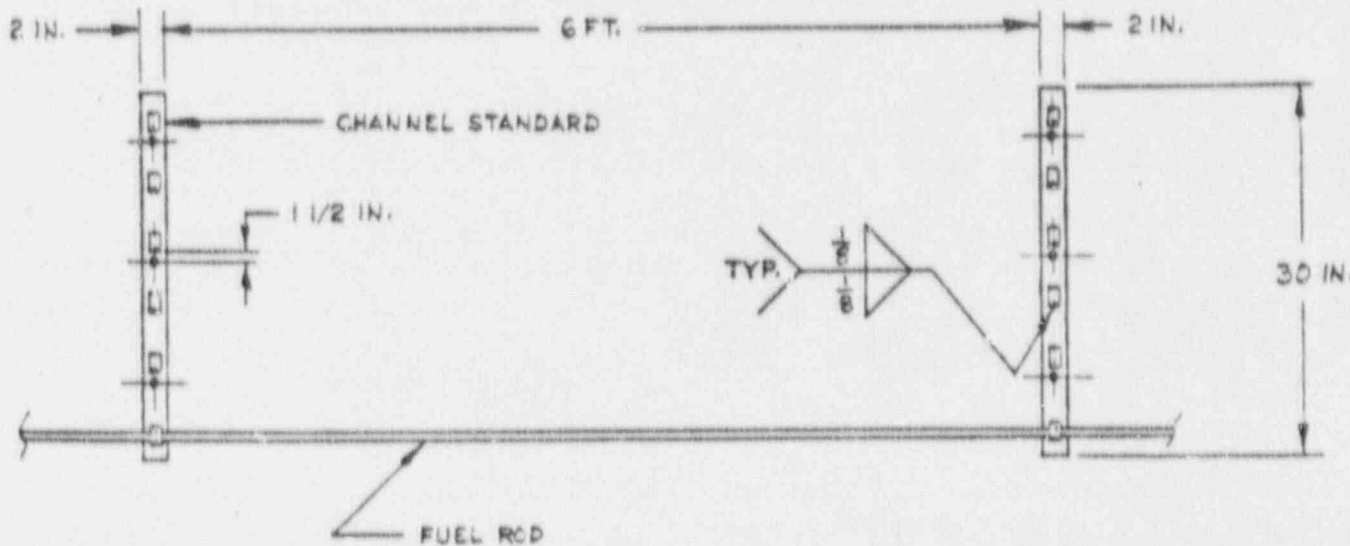


BUILDING 2 VAULT

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Object: Sketch 813-II -- Archive Fuel Rod Storage Array

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814. Bulk Storage of Low-Enrichment Materials

Special nuclear materials enriched in 5% U-235 or less may be stored in low-enrichment storage arrays to be constructed in the Uranium Fuel Development Laboratory. The types of materials to be stored in those arrays will include powder (primarily uranium oxide), pellets, fuel pellet stacks, and fuel rods.

Uranium oxide powder and pellets will be stored in an array constructed of metal shelving with receptacles sized to accept one metal container. Intermediate spaces will be blanked off to maintain a vertical and horizontal surface-to-surface separation of 2 ft between containers.

Limits for the maximum quantity of UO_2 which may be stored in each receptacle will be established, using Figure 309-XVII for powder and 309-XIII for pellets.

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815. Storage of Low-Enrichment Fuel Rods

Low-enrichment (not exceeding 5 w/o U-235) fuel rods may be stored in a safe geometry array. The rods will be physically secured in a fixed-geometry rack. This rack, loaded with rods, may be contained in a safe thickness of infinite slab not exceeding that given by Figure 309-XV.

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 815

Subject: EASTVIEW FACILITIES - Storage - Storage of Low-Enrichment Fuel Rods

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Section 800 - Eastview Facilities

Subsection 820 - Processing

SUBPART 821	INTRODUCTION
SUBPART 822	MATERIAL TECHNOLOGY LABORATORIES
SUBPART 823	URANIUM FUEL DEVELOPMENT LABORATORY
SUBPART 824	CHEMISTRY LAB

Case: SIR-671 Docket: 70-903 Section: 800 Subsection/Subpart: 820

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821. Introduction

1. The following subsections describe the handling, processing steps and some of the procedural controls used. Individual process steps, equipment, items, support information and safety limitations and considerations, and processing information are described in the appropriate subsections.
2. The Uranium Fuel Development Laboratory (Rooms 31, 33, 34A, 34B, 34C, 35, 39, 40 and 41), the Building 2 Vault (Room 32) and the Change Room (Room 24) as shown on Fig. 7 constitute a Controlled Area where un-clad, bare, exposed and un-encapsulated uranium may be processed.
3. The interaction between process operations is not calculated. Generally, each process operation is separated by three feet and identified as a criticality zone. This separation is exclusive of ports or shelves in storage devices. In lieu of determining the interaction between these process operations, a process area limit has been established using a safe surface density of 175 gm U-235 per square ft. The Process Area Limits are:

<u>Facility</u>	<u>Process Area Limit</u>
Material Technology Laboratories	933 Kgs U-235
Uranium Fuel Development Laboratory	1,159 Kgs U-235
Chemistry Laboratory	263 Kgs U-235

Details concerning these limits are set forth in Nuclear Safety Evaluation 821-I. The Possession Limits set forth in Section 100 will not be exceeded regardless of the Process Area Limit.

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 821

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4. The safe values referenced in the following Subparts will be obtained using The Tables and Figures referenced below:

<u>Safe Value</u>	<u>Table/Figure</u>
Mass	309-I, -II, -III, -XIII, -XVII, -XXI, -XXIII, -XXV
Volume	309-I, -XIV, -XVIII, -XXVI
Diameter	309-I, -XII, -XVI, -XX, -XXII, -XXVIII
Thickness	309-I, -XV, -XIX, -XX, -XXVII
Linear Density	309-III

Reference: SIM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 821

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I. Determination of Safe Surface Density Value

A safe surface density value of 175 gms U-235 per square foot of floor area was used. Reference Subsection 303.

II. Process Area Limit - Material Technology Laboratories

The Material Technology Laboratories are located in Rooms 17, 18, 19, 20, 23, 25, the Liquid Metals Lab and the X-Ray as shown on Fig. 7. These rooms and labs have a floor area of approximately 5,330 square feet.

$$\text{Process Area Limit} = 5,330 \text{ ft}^2 \times 175 \text{ gm U-235/ft}^2 = 933 \text{ Kgs U-235}$$

III. Process Area Limit - Uranium Fuel Development Laboratory

The Uranium Fuel Development Laboratory is located in Rooms 31, 33, 34A, 34B, 34C, 35, 39, 40 and 41 as shown on Fig. 7. These rooms have a floor area of approximately 6,622 square feet.

$$\text{Process Area Limit} = 6,622 \text{ ft}^2 \times 175 \text{ gm U-235/ft}^2 = 1,159 \text{ Kgs U-235}$$

IV. Process Area Limit - Chemistry Lab

The Chemistry Lab is located in Rooms 21 and 22 as shown in Fig. 7. These rooms have a floor area of approximately 1,500 square feet.

$$\text{Process Area Limit} = 1,500 \text{ ft}^2 \times 175 \text{ gm U-235/ft}^2 = 263 \text{ Kgs U-235}$$

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 821

Subject: NUCLEAR SAFETY EVALUATION 821-I - Process Area Limits

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822. Material Technology Laboratories

1. General Considerations

These laboratories are equipped for research and development on liquid and solid metals. Preparation of metallographic specimens, radiography, stereophotography, vacuum melting, hot pressing, powder pressing, welding, and heat treating are performed here. Also, clad fuel rods containing plutonium and uranium may be handled outside the vault.

2. Process Description

2.1 Uranium Fuel Rods

2.1.1 Typical operations will consist of testing procedures applied to a fuel rod which has been loaded in the Uranium Fuel Development Laboratory and sealed at one end. A plug will be placed in the open end as the rod is transported between laboratories.

2.1.2 Typical operations performed on the uranium-containing rods will involve analyses of gases contained in a sealed as-fabricated fuel rod containing uranium compounds only, with gas samples obtained by puncturing the fuel rod.

2.1.3 Testing of unirradiated fuel rods containing uranium only may be handled outside of the Uranium Fuel Development Laboratory. These operations will be performed in the Electron Beam Laboratory (Fig. 7, Room 20) utilizing the welding glove box, and in the Chemistry Laboratory.

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 822

Subject: EASTVIEW FACILITIES - Processing - Material Technology Laboratories

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2.1.4. In addition, chemical analyses will be performed in the Chemistry Laboratory. The proposed work involves handling of small samples of depleted and enriched uranium compounds, primarily uranium oxides.

2.2 Uranium-Plutonium Rods

2.2.1 The operations performed include: inspection for dimensions and surface condition; X-ray examination for position of the fuel, springs, and penetration of the welds; heating fuel rods to eliminate bubbles in the fuel clad sodium bond; sodium fill inside of a second capsule to fill the interstice space with sodium; welding in a glove box to seal the second clad after sodium filling; and eddy current testing for voids in sodium bonds. When the above operations are performed, the uranium and plutonium are contained in at least one all-welded and inspected container.

3. Nuclear Criticality Safety

Each room will be limited to either one of the safe values listed in Subsection 821.4 or one fuel assembly. For example, the Electron Beam Laboratory (Room 20, Fig. 7) typically handles only one rod at any one time containing not more than 75 gm of U-235 and the Chemistry Lab typically processes not more than 20 gm U-235. Both these amounts meet the limits listed in Table 309-I.

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 822

Subject: EASTVIEW FACILITIES - Processing - Material Technology Laboratories

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823. Uranium Fuel Development Laboratory

1. General Considerations

This is a separate area which is entered through a cold change and hot change room. It consists of a chemistry and ceramics area, a fuels test lab, a machine shop, a metallography lab, and a high bay materials processing lab. Throughout the area there are special walk-in hoods and fume hoods which are connected to a separate ventilation system. All the hoods connect through this ventilation system to high efficiency filters before the air is passed out of the building. The materials processing laboratory, a high bay area, is maintained under a negative pressure of approximately 1/2 in. of water. This uranium handling area is designed to perform experiments and pilot lot production on the chemical processing of uranium compounds, pelletizing and sintering of uranium compounds, experimental fabrication of cermet fuels, and casting and fabrication of uranium-containing alloys. A detailed layout of this laboratory is available in Fig. 7 (Rooms No. 35, 34A, 34B, 34C, 32, 33, 31, 39, 40, 41). Room No. 32 is the vault, located in the Uranium Fuel Development Laboratory, that is used for the storage of fissile materials.

The Uranium Fuel Development Laboratory will conduct research and development and pilot plant studies, the fabrication of ceramic fuel, the manufacture of cermet fuel, the casting and subsequent working of uranium-containing alloys, the testing of various uranium-containing fuels, and the metallography of various uranium-containing fuels.

A typical program conducted in the Uranium Fuel Development Laboratory involved the development of processes for conversion of UO_2 powder to sintered fuel pellets. The program involved development of the process on a pilot plant scale, and upon completion, the process was scaled up in the production facilities of Gulf United. In the course of the program, a major portion of the facilities and equipment of the laboratory was utilized.

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2. Process Description

Typical operations are summarized below:

2.1. Granulation

The initial phase of the program was devoted to development of suitable processes for press feed preparation, including studies of granulation by both wet and dry techniques. In initial experiments, UO_2 powder was mixed with various binders in a liquid-solids blender located in a chemical hood in Room 41. The granulations were characterized by sieving and weighing operations, also conducted in a chemical hood, and finally were dried in a forced draft oven.

In an alternate process, the powders were granulated by compacting in a mechanical press, and the compacts were disintegrated in a mill located in the walk-in hood in Room 41. The product from the mill was classified by a separator, located in the press-feed box in Room 31.

Material produced by either process was passed through a granulator in preparation for pressing; the operation was performed in the press feed box in Room 31.

2.2 Pressing

Granulations produced by these techniques were evaluated by preparation of compacts with a mechanical press. The press, located in Room 31, is fitted with a special enclosure vented into the hot exhaust system.

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2.3. Dewaxing

The pressed green compacts were dewaxed by heating to approximately 1650°F in a protective atmosphere. This operation was carried out in an Inconel tube furnace in Room 31. Compacts loaded in molybdenum boats were automatically pushed through the furnace tube following a determined cycle. Special ducts positioned at each end of the furnace were connected to the hot exhaust system. The effectiveness of dewaxing techniques was evaluated by chemical analysis of pellets.

2.4. Sintering

The dewaxed pellets were sintered in a dry hydrogen atmosphere using a molybdenum-wound furnace, also located in Room 31, and connected to the hot exhaust system similarly to the Inconel tube furnace.

2.5. Grinding

Representative sintered pellets were centerless ground in the centerless grinder, located in Room 39, using a water-oil emulsion type of coolant. A special ventilation duct positioned at the grinding wheel and connected to the hot exhaust system prevented any airborne contamination during the operation.

2.6. Inspection

Characterization of ground and unground pellets was conducted by means of density measurements, visual inspection, chemical analyses, and metallographic examination. All operations were carried out in chemical hoods or suitable vented enclosures.

3. Nuclear Criticality Safety

Same as described in Subpart 822.3.

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824. Chemistry Lab

1. General Considerations

The Chemistry Lab is located in Rooms 21 and 22 of Building 2 as shown on Fig. 7.

2. Process Description

The Chemistry Lab at Eastview is equipped for the following activities:

2.1 Qualitative and quantitative analyses using volumetric and gravimetric procedures and techniques of colorimetry, chromatography, atomic absorption, and radiochemistry.

2.2 Trace impurity analysis in nuclear fuels, coolants and alkali metals.

2.3 Environmental health and safety monitoring.

3. Nuclear Criticality Safety

Same as described in Subpart 822.3

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Section 800 - Eastview Facilities

Subsection 830 - Support Activities

SUBPART 831	VENTILATION SYSTEM
SUBPART 832	LIQUID WASTE SYSTEM
SUBPART 833	SOLID WASTE DISPOSAL

Case: SN1-871 Docket: 70-903 Section: 800 Subsection/Subpart: 830

Subject: EASTVIEW FACILITIES - Support Activities - Table of Contents

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831. Ventilation System

1. The ventilation system is of such a design that the entire laboratory area is maintained at a slight negative pressure. Each hood is exhausted to the ventilation system through an absolute filter. Each item of equipment capable of dispersing particulate matter and contributing to airborne contamination will be enclosed and exhausted to the ventilation system through an absolute filter.
2. A minimum lineal air velocity of 100 ft per minute is maintained at each vented opening. Maintenance of the required air velocity is confirmed by measurement, prior to starting operations involving the particular hood or equipment at the time installation is completed. The air velocity will be checked periodically.
3. The filtering media are roughing filters and absolute filters. The absolute filters are capable of filtering out micron-size particles at high efficiencies. All such filters are given a functional test according to the "Minimal Specification for the Fire-Resistant High-Efficiency Filter Unit," described in the AEC Health and Safety Information issue No. 212, dated 6/25/65. The absolute filters shall meet military specification MIL-F-51068A and "High Efficiency Air Filter Units" UL-586.
4. Hoods are made of various types of material, depending on the type of work permitted in the particular unit. Materials of construction consist of Fiberglas, stainless steel, carbon steel, and transite. Windows consist of Plexiglas and safety glass.

Reference: SNM-871 Docket: 70-903 Section: 800 Subsection/Subpart: 831

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5. Exhaust ducts and filter plenums for the laboratory system are made from galvanized steel. The inside surfaces have been coated with a fire-and chemical-resistant epoxy paint to prevent corrosion by chemical fumes.
6. All components of the ductwork system consist of fire-resistant materials. Since the materials will not support combustion, no analysis of the effects of fire has been made.
7. Filters in the exhaust system are completely sealed in the housings. Changing of this type of filter is accomplished by pulling them out of the housing into plastic bags.
8. Prefilters are used in every location to preserve the absolute filters.
9. Maximum allowable pressure drop across a filter is 3-in. W.G. Each filter housing has pressure taps permanently mounted so that pressure drop measurements may be made.
10. Filters to be used in the plenum are DOP tested at ORNL prior to use. DOP testing of installed final filters will be performed.
11. The types of work permitted in the hoods do not impose any live loads. The static loads consist of only the weight of chemical laboratory types of equipment.
12. The materials of construction are fire-resistant and corrosion-resistant.
13. Unclad plutonium is not permitted anywhere in this facility. Inasmuch as only uranium will be used, a maximum permissible surface contamination level for the hood enclosures has not been established.

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832. Liquid Waste System

1. The laboratory is equipped with a liquid waste system which is separate from the cold drainage system.
2. Hot liquid wastes are collected alternately in hold-up tanks, each of 2000-gallon capacity, which are located below grade in a hot waste pit adjacent to Building 2.
3. Liquid waste collected in each tank is evaluated for contamination by radiological analysis.
4. If analysis indicates an acceptable low level of contamination, the contents of the tank, after filtration, may be dumped into the sanitary sewer. No dumping may be done without approval of the NIS Representative.

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833. Solid Waste Disposal

1. Waste material generated in the laboratories consists primarily of solids. Small quantities of liquid waste which are accumulated may be converted into a solid form or absorbed into special absorbents for disposal. Waste consisting of special nuclear material will be shipped to commercial facilities for recovery or disposal, as prescribed by AEC regulations.
2. Solid waste generated at Elmsford is stored in the Waste Storage Area after the drum has been filled and the lid sealed. During the filling of the drum, the waste is stored inside the laboratory.

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